

# COMPUTERWORLD

## INSIDE

In Depth — 12 tips for better systems implementation. Page 79.

Integration Strategies — TWA Vacations, an exclusive DEC interview and much more. Page 63.



**Profile: Donna Rund** weaves cloth out of CASE software threads for

Levi Strauss. Page 57.

**Bellsouth blasted** after feds drop hacking charges in connection with computer file that wasn't so confidential after all. Page 8.

**OSF seeks cross-platform** network management approach. Page 111.

**An era passes** as IBM prepares to unload Selectric typewriter division along with low-end printer manufacturing. Page 112.

**\$200 million gusher** comes in for Andersen Consulting in outsourcing contract with Sun R&M. Page 4.

**It's spreading!** After two decades in the isolation wards, the MUMPS operating system begins to infect commercial operations. Page 25.

**Despite more red ink** at Wang, customers say embattled firm has turned the corner on servicing their needs. Page 4.

## Fujitsu move rattles Europe

BY AMIEL KORNEL  
CW STAFF

For the ever-so-polite British, Fujitsu Ltd.'s deal last week to acquire 80% of the UK's national computer champion, International Computers Ltd., was no less than an appalling breakdown in decorum. "Cheeky," trumpeted the front-page headline of one British tabloid.

Indeed, the polite competition that has characterized the European mainframe computer market is giving way to a no-holds-barred free-for-all that could leave vendors — particularly IBM — bruised and bleeding.

European buyers seem more open to moving to alternative suppliers. Plug-compatible mainframe vendors such as Amdahl Corp. — 44% of which is owned by Fujitsu — and Hitachi Data Systems Corp. have seen improvements in their European

dealings during the past two years.

"People are much more prepared to use PCM machines than three to five years ago," said George Goodwin, who was chairman of the UK IBM Computer Users Association until last April. "What they're saying

to IBM is that [IBM's] machines don't command a premium anymore."

Market leader IBM — which last year earned 37% of its revenue in Europe — could find itself in for a pummeling. Several factors are converging to put

*Continued on page 113*

### The changing face of Europe

*Already partial owner of and main components supplier to Amdahl, Fujitsu is rapidly building a more potent team to challenge IBM mainframe sales in Europe*



#### Value of European mainframe shipments (in millions)

	1989	1990 (estimated)
<b>Total European market</b>	<b>\$8,440</b>	<b>\$9,069</b>
IBM	\$4,400	\$5,514
ICL	\$200	\$165
Fujitsu	\$40	\$75
Amdahl	\$490	\$649
Siemens*	\$740	\$471
Hitachi Data Systems	\$270	\$279
Compax**	\$520	\$505

\* Fujitsu reseller \*\* Hitachi reseller

Source: International Data Corp.

CW Chart: Paul Mock

## Deficit debate growing old for nervous industry chiefs

BY NELL MARGOLIS  
CW STAFF

The staggering federal deficit has generated a ton of lip service but received only an ounce of debt service.

Last week, however, as Democratic and Republican congressmen once again appeared incapable of dealing with a budget estimated to be \$169 billion in the red for 1991, several technology executives said that ignorance and inaction are luxuries that the computer industry can no longer afford.

Moreover, computer industry leaders — their nerves steeled, many said, by similar bullet-biting at their own companies — appeared ready to face the overwhelming probability that both spending cuts and tax hikes, rather than one or the other,

er, will be needed to achieve any meaningful deficit reduction. While those leaders differed as to emphasis and priority, the bottom-line results they were seeking were the same.

"We need to reduce the federal deficit. It's been a millstone around our necks for the past decade," said Everett Ehrlich, vice-president of financial and economic planning at Unisys Corp. "It's economically absurd to think we can have a robust business sector in a country that spends more than it earns."

The computer industry, many

*Continued on page 111*

## Key contracts pay for MCI data push

BY GARY H. ANTHERS  
CW STAFF

WASHINGTON, D.C. — Driven by demands from its largest customers, MCI Communications Corp. is evolving from a low-cost provider of voice services to a full-service telecommunications vendor. Along the way, the company has borrowed a philosophy from another industry: When you're No. 2, you have to try harder.

MCI is using the big bucks of its key accounts to develop data-oriented capabilities such as bandwidth on demand, customer control of the network and applications that include videoconferencing and electronic

data interchange. Donald M. Heath, vice-president of data marketing, a position established last year, said the firm's emerging data strategy is based on landing customers whose \$1 million-plus annual billings can justify custom development

work while funding product development.

The focus on specific market opportunities works to the advantage of both parties, said Hugh Hoffman, network manager at Northwestern Mutual Life Insurance Co. Two years ago, the insurer teamed up with MCI in what at the time was a unique arrangement to locate NML's packet switches at MCI facilities. That became the basis for a 10-node nationwide backbone connecting local-area networks at more than 100 of the firm's agencies. MCI's willingness to undertake the arrangement was decisive in NML's choice of

*Continued on page 8*

### Spanning the country

# MCI

*MCI has been on an investment binge in an effort to cement its role as the No. 2 long-distance carrier*

☎ 1990 investment in network:	\$1.2 billion
☎ Total network investment:	\$7 billion
☎ Total U.S. route miles:	46,300
Digital fiber-optic miles:	17,600
Digital microwave miles:	13,000
☎ U.S. circuit miles:	1.2 billion
☎ Fiber-optic bandwidth:	405M bit/sec. 1.8G bit/sec.

CW Chart: Paul Mock

# IN THIS ISSUE

## NEWS

**4 Sun R&M** snuffs IS department in outsourcing deal with Andersen Consulting.

**4 Wang** users remain loyal despite fourth-quarter losses.

**6 Sticky picket: The League for Programming Freedom** returns for an encore demonstration against Lotus.

**8 An eye for an eye: Craig Neidorf's** attorney threatens a lawsuit against Bell-south.

**10 Expert systems** rise from the ashes of overblown expectations.

**12 Ashton-Tate** lays it on the bottom line with its new, thoroughly tested Dbase IV.

**14 Compaq** takes a page from its competitors' notebook with slashed prices on its tiny portables.

**111 Open Software Foundation** reaches for the heights with plans for a network management environment.

**112 The Dallas police department and Bergen Brunswig Corp.** share honors as recipients of SIM's Partners in Leadership awards.

## Quotable

*"I don't think this is the last case of a Japanese takeover."*

MARTIN HINGLEY  
IDC EUROPE LTD.

*On Fujitsu's purchase of ICL.  
See story page 1.*

## SYSTEMS & SOFTWARE

**25 Index** connects with Deloitte & Touche to introduce a full life cycle of CASE tools.

## PCs & WORKSTATIONS

**35 EISA** still at the bus stop, waiting for users to climb aboard.

## NETWORKING

**47 Abroad-minded firms** see overseas promise to Virtual Private Data Network.

## MANAGER'S JOURNAL

**57 Levi Strauss' Donna Rund** tailors some major changes into IS.

## INTEGRATION STRATEGIES

**63 Weaving** imaging into the fabric of your organization.

## COMPUTER INDUSTRY

**83 Apple Europe** is one of the most fruitful of the vendor's divisions.

## IN DEPTH

**79 A new study** yields valuable pointers for systems implementation projects. By Glen B. Beckley and Michael Gaines.

## DEPARTMENTS

**6, 112 News** Shorts

**18 Advanced Technology**

**22 Editorial**

**61 Calendar**

**93 Computer Careers**

**102 Marketplace**

**107 Training**

**110 Stocks**

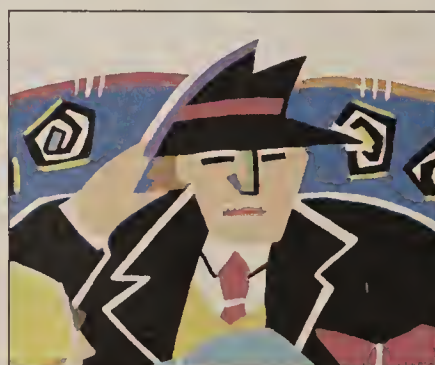
**114 Trends**

**"T**he key to competitive advantage is taking the technology and applying your own value-added and executing it. And the key to executing it is trained people who understand that technology better than somebody else does . . . Simply taking that box is not where the competitive advantage is. . . Providing the technology tools to seize new business opportunities has always been our strength, the creativity of the new products we come up with. And those products? They're nothing more than information services." DuWayne Peterson, IS chief at Merrill Lynch & Co., from a recent keynote address.



Josef Gast

*Tips for better systems implementation. Page 79.*



Joni Levy-Liberman

*User groups lobby to influence product directions. Page 47.*

# EXECUTIVE BRIEFING

■ **Outsourcing** claimed another major convert as Sun R&M handed over its data center and network management to Andersen Consulting for the next 10 years. The \$200 million contract came after the firm, a division of \$10 billion oil giant Sun Co., decentralized its IS and found it had excess CPU capacity and personnel. Andersen will acquire Sun's Dallas data center and an unspecified number of operations employees; Sun will retain applications development. **Page 4.**

■ **IBM's AS/400 line** will get a big boost later this month with a major new product rollout. IBM executive Robert LaBant confirmed that the midrange bulwark will get at least six new low-end models, a new release of the OS/400 operating system and performance upgrades for the high-end Model 70. LaBant also said that IBM has resolved any internal political woes resulting from customers using the AS/400 to replace their mainframes. **Page 1.**

■ **Thirty expert systems users** described their applications at the annual AAAI conference on artificial intelligence. Such companies as Eaton, Sears and Owens-Corning Fiberglas are trying to expand the use of expert systems within their organizations, while vendors say the trend is just beginning to take off. At the conference, IBM unveiled a new family of expert systems development tools. **Page 10.**

■ **Michael Lanier, a former Charles Schwab executive,** will take over the top IS post at DHL Worldwide Express. Lanier, who has been a consultant since leaving Schwab two years ago, will replace retiring IS chief William Pigott at DHL. **Page 6.**

■ **The city of Dallas and Bergen Brunswig** copped the fourth annual SIM awards for IS innovation resulting from management partnerships. Dallas was honored for the integration of several information technologies in its police department, while Bergen Brunswig was cited for almost 20 years of automation leadership in the distribution industry. **Page 112.**

■ **The mainframe market battle in Europe** is heating up. Fujitsu's acquisition of a controlling stake in Britain's ICL signals a more aggressive Japanese push, while a growing movement toward open systems and downsizing is putting the squeeze on margins. IBM pricing reflects the brewing battle, with main-

frame discounts reaching 45% in some cases. **Page 1.**

■ **Ever think of pitching a systems proposal** on the basis of its impact on earnings per share — or even the price of your company's stock? Fourth Shift Corp. uses such an approach to sell its LAN-based MRP II software. **Page 57.**

■ **Systems implementations often fail** because of poor or inappropriate participation by top executives, especially in midsize firms with sales between \$40 million and \$100 million, according to a new study. Critical success factors include good staffing, structure, organization, timing, control, communication, vendor relationships and training. **Page 79.**

■ **On-site this week:** Automation is no fish story at Mrs. Paul's Kitchens. Approximately 35% of the Philadelphia-based seafood products firm's brokers now place their orders electronically, replacing a facsimile/manual data entry system and enabling one-day turnaround. **Page 50.** New York Life has provided 1,000 of its 10,000 independent agents with a PC-based sales system, allowing them to do policy sales "paperwork" electronically at the customer site. **Page 39.** Paperwork is also on the wane at Grumman Corp.'s legal department, thanks to a Wang-based imaging system. Document research and retrieval have been sped up dramatically. **Page 29.**

# DAY IN AND DAY OUT, SYNCSORT PERFORMS BRILLIANTLY FOR VM AUDIENCES.



VM audiences count on Syncsort for the best performing VM sorting, backup, and archive products. Products that save system resources — CPU time, I/Os, elapsed time, disk space — day in and day out.

**Syncsort/BACKUP (SYBACK)** performs the fastest logical and physical backups, giving you complete file, minidisk, volume and system-level protection. And for disaster recovery, no product can restore a system faster.

**SyncSort CMS** is simply the fastest, most efficient sort, merge and copy product in the VM world.

**Syncsort/ARCHIVE** stores, tracks and retrieves little-used files. User-oriented and exceptionally easy to use, Syncsort/ARCHIVE makes archiving routine, freeing up valuable disk space.

And that's not all. Over the next few months, VM audiences will be introduced to Syncsort's new high performance productivity tools. Unlike other software companies, our commitment to VM is strong — and growing stronger.

If you're looking for today's best performing VM products, look to the company that leaves audiences cheering: Syncsort.

**syncsort**  
INC.

50 Tice Boulevard, Woodcliff Lake, NJ 07675

**800-535-3355**

# Sun R&M opts for outsourcing

BY ELLIS BOOKER  
CW STAFF

PHILADELPHIA — Sun Refining and Marketing Co. last week became the second energy company to pass the torch for its information systems department to Chicago-based Andersen Consulting.

The 10-year, \$200 million outsourcing deal follows a decentralization at Sun R&M last year that moved IS employees closer to the various business units [CW, June 18].

That restructuring, which reduced the operations staff from more than 100 employees to about 70, still left the IS department with excess capacity, personnel and building space, according to Sun R&M officials.

"We had a good building and a staff capable of more than we asked," said Jack Donohue, director of IS. At the beginning of the year, he said, the firm began looking for someone "who'd value staff and the center."

Asked about staff levels for the data center it plans to acquire, an Andersen spokesman said that because the deal had yet to be cemented, the firm had no comment on any plans regarding personnel or staffing.

Donohue confirmed that Andersen was one of three compa-

nies who bid on the deal but would not name the others.

The letter of intent signed by Sun R&M and Andersen last week calls for Andersen to acquire Sun R&M's Dallas Computer Center, hire its employees and manage the firm's data processing and Systems Network Architecture backbone network. Sun R&M is one of several units that make up Sun Co., a 105-year-old energy firm headquartered in Radnor, Pa.

An Andersen spokesman said that the contract, which should be finalized soon, was one of its largest facilities management jobs to date. Andersen's "systems management" business contributed \$100 million — about 7% — to its total of \$1.44 billion in revenue last year. At Andersen, systems management includes traditional facilities management as well as software re-engineering, network management and disaster recovery services.

The Sun outsourcing contract is Andersen's second with an energy firm. Last March, it took over management of data processing and data communica-

tions for Dallas-based Maxus Energy Corp.

"We're realizing about 20% annual savings" on a \$5 million to \$8 million annual IS budget, said Maxus Director of IS John Seifrick. Seifrick said he believes he received a particularly good

deal because Andersen wanted to establish a beachhead in the area.

Andersen hired 30 of Maxus' 70 IS employees to run the Amarillo, Texas, data center. However, within six months this center had been relocated to a new Andersen facility in

Irving, Texas, where it now supports the back-office computing for Maxus and at least two other companies.

"We kept database administration, applications development, help desk and scheduling [functions]," said Seifrick, whose development work these days is focused on cooperative networked applications using personal computers and workstations. Sun R&M will retain its applications development in-house, as well as management of local-area networking and departmental computing.

Outsourcing the highly spe-



Sun R&M's Donohue: excess CPU

## Users root for Wang rebound efforts

BY SALLY CUSACK  
CW STAFF

LOWELL, Mass. — Users greeted Wang Laboratories, Inc.'s predicted fourth-quarter loss with a strong show of support last week as the minicomputer maker posted a net loss of \$496.7 million, or \$3.01 dollars per share.

"It wasn't unexpected," commented Matt Gillman, president of the U.S. Society of Wang Users. "We realize Wang needed to take strong steps over the past 12 months, and we're optimistic about the upcoming year. Wang is taking care of the basics."

Among those basics, Wang is continuing to prune its work force. According to a spokeswoman, the company plans to cut between 1,000 and 1,300 positions at 100 offices worldwide this quarter. No specific groups have been targeted. Wang currently has 20,900 employees on its payroll, down 27% from one year ago.

Revenue from continuing operations totaled \$652.2 million in the fourth quarter, compared with a restated \$750.9 million in

last year's fourth quarter. Revenue for the year totaled \$2,497.2 million, compared with a restated \$2,909.9 million in fiscal 1989.

Referring to Wang Chief Executive Officer Richard Miller's Operation Customer campaign

According to Hugh V. Naughton, director of information systems at the Gas Research Institute in Chicago, Wang has made an "outstanding" effort to improve customer relations. The Gas Research Institute has been a Wang customer for more than 10 years. Naughton indicated that Wang has provided users with demonstrations of products being beta-tested — something almost unheard of two years ago.

"Now they even apologize for the roughness of the beta-test versions," Naughton said. "Before, if you did see a product at that point in development, you had to sign multiple nondisclosure agreements."

With more than 50,000 proprietary VS system installations worldwide, Wang must provide existing customers with an upward migration path and simultaneously establish itself as a significant player in the imaging applications marketplace to reach its goal of profitability for the fiscal year that began July 1.

"They are getting ready to make the open systems push,"

cialized and often proprietary scientific computing functions of an energy company could be difficult, observed Dudley Cooke, former chief information officer at Sun Co. "When it's just refining and marketing, it's more of a factory operation — traditional data processing as opposed to scientific [processing]," he said.

Cooke, who left Sun in late 1988 and is now president of The Executive Insight Group, a management consultancy in Bryn Mawr, Pa., said that in Sun's case, this problem was eliminated in 1988 when the parent corporation divested its exploration and energy production operation. Oryx Energy Co. in Dallas now handles Sun's scientific computing jobs.

Like many outsourcing customers, Sun elected not to hand over its applications development to an outsider. This function will remain inside Sun R&M, located primarily in Philadelphia. The remaining IS staff numbers approximately 380.

Andersen's services will be sold back to Sun on a variable cost basis, although Donohue declined to share the size of the company's IS budget. "The savings will be substantial," he said. The 15-year-old Dallas data center contains four IBM mainframes — an IBM 3090 Model 400E, a 3090 Model 120E, a 3084 and a 4381 — that last year supported about 5,500 users.

said David Card, an analyst at International Data Corp., a market research firm based in Framingham, Mass. "Wang is not a start-up; they have to network entire companies and be able to solve a variety of needs. And they are making a serious effort to know their customers — it's not just hype."

Stephen L. Koller, a Wang 7010 computer user and director of information services at Stamford, Conn.-based International Executive Service Corp., said he believes that Wang has "really turned the corner on customer service. There is no more passing the buck. When there has been a problem with either a product or an individual, Wang has seen it resolved."

Wang's net loss for the quarter included restructuring and other special charges totaling \$417 million and year-end adjustments representing changes in estimates to annual expense and income items of \$24.2 million. Last year's fourth quarter ended with a loss of \$374.7 million, or \$2.29 per share.

### CORRECTION

Second-quarter net income for Tandem Computers, Inc. was incorrectly stated [CW, July 23]. Tandem's net income rose 5.5% to \$32.4 million.

### Declining realities

*Reduced shipments in 1989 hampered Wang's growth in the midsize systems market and eroded its presence in the small systems market*

WANG	Worldwide shipments		Worldwide installed base	
	1988	1989	1988	1989
Midsize systems	1,430	1,014	8,106	8,483
Small systems	8,840	7,460	75,277	66,999

Source: International Data Corp.

CW Chart: Paul Mock

of the past year, Gillman said that Wang certainly has done a better job of servicing the user community but feels that it still has a long way to go to achieve total turnaround. "The type of change Miller is orchestrating does take time," he noted, adding that the results he has already seen seem "most encouraging."

## COMPUTERWORLD

Editor in Chief  
Bill Laberis

Executive Editor  
Paul Gillin

News Editor  
Peter Bartolik

Assistant News Editor  
James Connolly

Senior Editors

Clinton Wilder, Management  
Elisabeth Horwitz, Networking  
Patricia Keefe, PCs & Workstations  
Michael Alexander, Advanced Technology  
Rosemary Hamilton, Systems & Software  
Nell Margolis, Industry

Senior Writers

Alan J. Ryan  
Maryfran Johnson  
Joanie M. Wexler  
Richard Pastore

Staff Writers

Sally Cusack  
Maura J. Harrington

New Products Writer  
Gary Byrne

Features Editors

Glenn Rifkin  
Joanne Kelleher

Senior Editors

Michael L. Sullivan-Trainor  
Amiel Kornel  
Joseph Maglitta,

In Depth/Integration Strategies  
Mary Grover, Product Spotlight

Managing Editor, Special Projects  
Lory Zottola

Senior Writer

David A. Ludlum

Associate Editor

Laura O'Connell

Researchers

Jodie Naze  
Kim Nash

Interns

Kelly E. Dwyer  
Derek Slater

Chief Copy Editor

Donald St. John

Assistant Chief Copy Editor

Joyce Chutchian

Features Copy Editors

Cathleen A. Duffy  
Carol Hildebrand

Copy Editors

Catherine Gagnon  
Christopher Lindquist  
Kimberlee A. Smith  
Alice Lesch

Design Director

Nancy Kowal

Graphics Designer

Tom Monahan

Graphics Specialist

Paul Mock

Design Assistant

Marie J. Haines

Graphics Researcher

Kevin Burden

Assistant to the Editor in Chief

Linda Gorgone

Editorial Assistants

Lorraine Witzell  
Tammy Gryniewicz  
Stefanie McCann

Rights and Permissions Manager

Sharon Bryant

Back Issues

Margaret McIndoe

News Bureaus

Mid-Atlantic

201/967-1350

Johanna Ambrosio, Senior Correspondent

Washington, D.C.

Mitch Betts, National Correspondent

202/347-6718

Gary H. Anthes, Correspondent

202/347-0134

West Coast

415/347-0555

Jean Bozman, Senior West Coast Editor

J.A. Savage, Senior Correspondent

James Daly, Senior Correspondent

Jim Nash, Correspondent

Chris Flanagan, Editorial Assistant

Midwest

708/827-4433

Ellis Booker, Bureau Chief

Michael Fitzgerald, Correspondent

IDG News Service

Penny Winn, Director

Main Editorial Office

Box 9171, 375 Cochituate Road

Framingham, MA 01701-9171

508/879-0700

Fax: 508/875-8931

MCI Mail: COMPUTERWORLD

Subscriptions: 800/669-1002

# If DB2 Is The Answer, What The Heck Was The Question?

Beginning to wonder about betting your company's future on DB2?

Wouldn't you like to know how IBM's information management approach will address the major problems and issues you'll face in the 90s?

We think you would. So, we've developed a check-list of what's most important to you.

So you can clearly see what you can expect from IBM.

And what you can expect from us.

		IBM	CA
INVESTMENT PROTECTION: Runs applications without change from...	DL/1		✓
	IMS		✓
	VSAM		✓
	TOTAL		✓
	CA-IDMS		✓
	CA-DATACOM		✓
PORTABILITY Runs identically on...	MVS		✓
	MVS/XA	✓	✓
	MVS/ESA	✓	✓
	VSE		✓
	VM		✓
	PC-DOS		✓
	PC LAN		✓
STANDARDS	ANSI SQL	✓	✓
	FIPS	✓	✓
	SAA	✓	✓
	NAS		✓
DISTRIBUTED DATABASE	Remote Request	✓	✓
	Distributed Request		✓
	Replication		✓
	Partitioning		✓
INTEGRATION	Dictionary		✓
	w/Systems Security		✓
PROVEN: Supports tens of thousands of mission-critical applications			✓

As the world's leading independent software company, Computer Associates can give you more.

Much more.

To begin with CA-IDMS®/DB and CA-DATACOM/DB® are more practical, productive and proven than DB2. Offering you a clearly superior alternative.

Our comprehensive software

engineering solutions and integrated life-cycle support are ready today including: 4GL's; one of the industry's most successful COBOL development environments; application generators; knowledge-based systems and products for project estimation and change management.

In addition, our information management solution is built upon the Computing Architecture For The 90s which can free you from hardware

constraints. All of your mission-critical

applications can run on multiple platforms and operating systems from mainframe to midrange to PC.

CA90s also protects the massive investment you've made in your existing applications with transparency software that allows you to run your present applications unchanged using our relational database technology.

Altogether, it's a smarter, more practical approach to information management.

And one that's readily available today.

Which leaves just one question for everyone who's still patiently waiting for IBM...

*What are you waiting for?*



**COMPUTER ASSOCIATES**  
Software superior by design.

## NEWS SHORTS

### Schwab's Lanier takes DHL wheel

Michael Lanier, former senior vice-president in information systems at Charles Schwab & Co., will take over the top IS slot at DHL Worldwide Express this week following the retirement of Senior Vice-President of MIS William Pigott. Lanier left Schwab shortly after the resignation of Executive Vice-President of Information Services Woodson Hobbs in the summer of 1988, according to a Schwab employee. Mark Barmann replaced Hobbs as the San Francisco investment firm's CIO. Lanier reportedly spent the interim between his resignation from Schwab and his appointment at DHL working as an independent consultant.

### Layoff at Bull

Bull HN Information Systems, Inc. confirmed last week that Groupe Bull plans to reduce its work force by as many as 3,000 people worldwide in the coming year. According to David Dotlich, executive vice president for corporate relations, the majority of the layoffs will occur in Europe. While the company currently has no plans to reduce the stateside staff, Dotlich did not rule out that possibility as the company continues to downsize throughout the year.

### Nynex to test radio links

The Nynex Science and Technology unit of Nynex Corp. applied to the Federal Communications Commission for an experimental license to test and evaluate digital radio technologies last week. The tests are intended to determine whether these technologies can be used to transmit telephone calls between customers and telephone company sites. Deploying digital radio technology in the local exchange carrier distribution system or local loop could result in better overall service and significant cost savings, the company said.

### Norton Utilities gets LAN support

Symantec Corp.'s Peter Norton Computing group last week announced Version 5.0 of its Norton Utilities package for IBM-compatible MS-DOS machines, extending support to Novell, Inc.'s Netware operating system in an effort to broaden Utilities' estimated current base of 1 million personal computer users. Utilities 5.0 "rides" Netware to access remote disk drives scattered throughout a Novell local-area network. Users see simulated disk drive lights on their screens that indicate whether remote drives are being accessed, according to the vendor. Users reportedly can use Utilities' Unerase capability, for example, for any drive they are able to access through Netware.

### Data Switch eyes LAN business

Data Switch Corp., a maker of matrix switches and other management and control systems for data processing and communications applications, said last week it has entered into a technical agreement with token-ring and internetworking vendor Proteon, Inc. Data Switch will reportedly incorporate Proteon router technology into its products in an effort to link LANs to the corporate data center. The company said it will also resell Proteon products such as token-ring network adapter cards as accessories. The announcement falls on the heels of matrix switch rival Bytex Corp.'s comparable move to expand into the LAN business with its acquisition of Chantilly, Va.-based Vance Systems Corp., maker of the ATS LAN 1000 protocol analyzer.

### Daisy shrivels

Workstation pioneer Daisy Systems Corp. was dragged into bankruptcy court by its creditors and responded with a voluntary reorganization request last week in San Jose, Calif. The involuntary Chapter 11 proceedings began in May when six creditors asked the Federal Bankruptcy Court in Colorado to initiate reorganization. Except for 1988, Daisy has shown losses since 1986, with a \$140 million loss last year.

*More news shorts on page 112*

## Lotus litigation draws protest

BY MICHAEL ALEXANDER  
CW STAFF

*"1-2-3-4, kick that lawsuit out the door; 5-6-7-8, innovate don't litigate; 9-A-B-C, interfaces should be free; D-E-F-O, look and feel has got to go."*  
— League of Programming Freedom "hex chant."

For the second year in a row, Lotus Development Corp. was the target of demonstrations last week by the League of Programming Freedom, a group formed to protest litigation over the look and feel of user interfaces.

About 300 demonstrators — twice as many as last year — assembled in a small park next to Lotus' Cambridge, Mass. headquarters to listen to speeches by Richard Stallman, the league's founder; Patrick Winston, director of MIT's artificial intelligence laboratory; and other well-known figures in academia and the computer industry.

"We have come to warn the public of the terrible harm that Lotus is trying to do to computer users," said Stallman, developer of Emacs, a widely used programming editor. Stallman recently received a MacArthur Foundation fellowship for his efforts to promote free software.

Copying and using computer interfaces is as old as the software industry itself, said Stan Kugell, founder and former president of Javelin Software Corp.

"The irony is that Lotus and



Stephen Sherman

**League of Programming Freedom launches demonstration at Lotus last week, insisting that 'look and feel has got to go'**

Apple probably would not exist today if there had been look-and-feel copyrights," Kugell said. The look and feel of Lotus 1-2-3 is closely based on Visicalc, and that of the Apple Macintosh is based on work by Xerox Corp. and others, he said.

Stallman and other league members charged that look-and-feel lawsuits by Lotus, Apple Computer, Inc. and Ashton-Tate Corp. will stifle innovation and force programmers to develop incompatible interfaces simply to avoid copyright litigation.

In June, Lotus won a copyright infringement lawsuit filed against Paperback Software International, Inc. and Mosaic Software, Inc. Lotus has also filed similar suits against Borland International and The Santa

Cruz Operation.

"Unfortunately, Lotus has won the first battle," Stallman told the gathering. While it is possible that the Supreme Court may eventually overturn the Lotus decision, the League hopes to prod Congress into "letting us continue doing what we have always done," Stallman said.

The protestors walked a picket line in front of Lotus for about 30 minutes, carrying signs and chanting slogans.

Asked to comment on the complaints that lawsuits stifle innovation, a Lotus spokesman said: "We disagree with that position because we feel that copyright law provides a legal framework that encourages the innovation that has driven the software industry's success."

## AS/400s

FROM PAGE 1

back lost accounts from other vendors at an escalating rate, the vice-president of application business systems said.

Just a few weeks past its second anniversary, the AS/400 has sold twice as many systems as the wildly popular System/36 did in its first two years, LaBant said. Revenue growth for the line was 27% last year.

LaBant also spoke frankly of the AS/400 as a replacement system for other IBM platforms, such as the aging 3080 mainframe line, indicating that IBM has resolved whatever internal strife the "downsizing" trend may have caused.

He and other IBM managers insisted that the RISC System/6000 Powerstations and servers pose no threat to their midrange darling. Just as Digital Equipment Corp. officials say their Unix-based workstations will not erode their commercial systems base, so does IBM believe that the RS/6000 will snare mainly technical and scientific users while the AS/400 remains the choice for business use.

"Actually, I think the market will decide it for us, as usual," said Bob Dies, a marketing manager for AS/400s. While there are no plans to add Unix to the AS/400, IBM does intend to improve connectivity between the AS/400 and the RS/6000, he added.

The overall strategy for the AS/400's future also includes greater emphasis on customizing applications, such as imaging and voice/data transmission. Users can expect IBM to keep expanding the power of high-end processors, LaBant said, while dropping low-end entry-level prices into the workstation arena between \$10,000 and \$15,000.

Users who have topped out on their Model 70s, however, will have to wait until 1991 for IBM's new high-end models — and for the multiprocessing capabilities IBM has promised.

LaBant spent many of his first 90 days on the job visiting customers, including a handful of large customers who are installing hundreds — in one case,

thousands — of AS/400s. Most of the AS/400 sales have gone into what IBM calls "multiples" accounts, where customers install anywhere from a few to several hundred machines and most use PC networking software.

"What has not been well publicized is the role the AS/400 is playing at large multiples," LaBant said.

In his talks with customers, LaBant also heard requests for the long-promised distributed database capabilities

— one of the features on the list of Systems Application Architecture (SAA) pledges. The AS/400 is also late in providing Rexx, a high-level procedural language that is part of SAA.

However, LaBant and his managers insisted that other than those two features, the AS/400 is on schedule. "My lab in Rochester, [Minn.], has to provide those SAA functions," he said. "I have to make sure we are moving down the SAA path as fast as possible and along with everyone else."



IBM's LaBant

# New Twist On An Old Problem

*Oracle's protocol-transparent network products unify incompatible networks.*

If you like industry standards you'll love networking. Because there are so many network standards: Ethernet, Token Ring, Named Pipes, DECnet, LU6.2, FDDI, TCP/IP, SPX/IPX, X.25, SNA, etc.

Oracle's software lets you integrate all the networks you have today and adopt new technologies as they emerge.

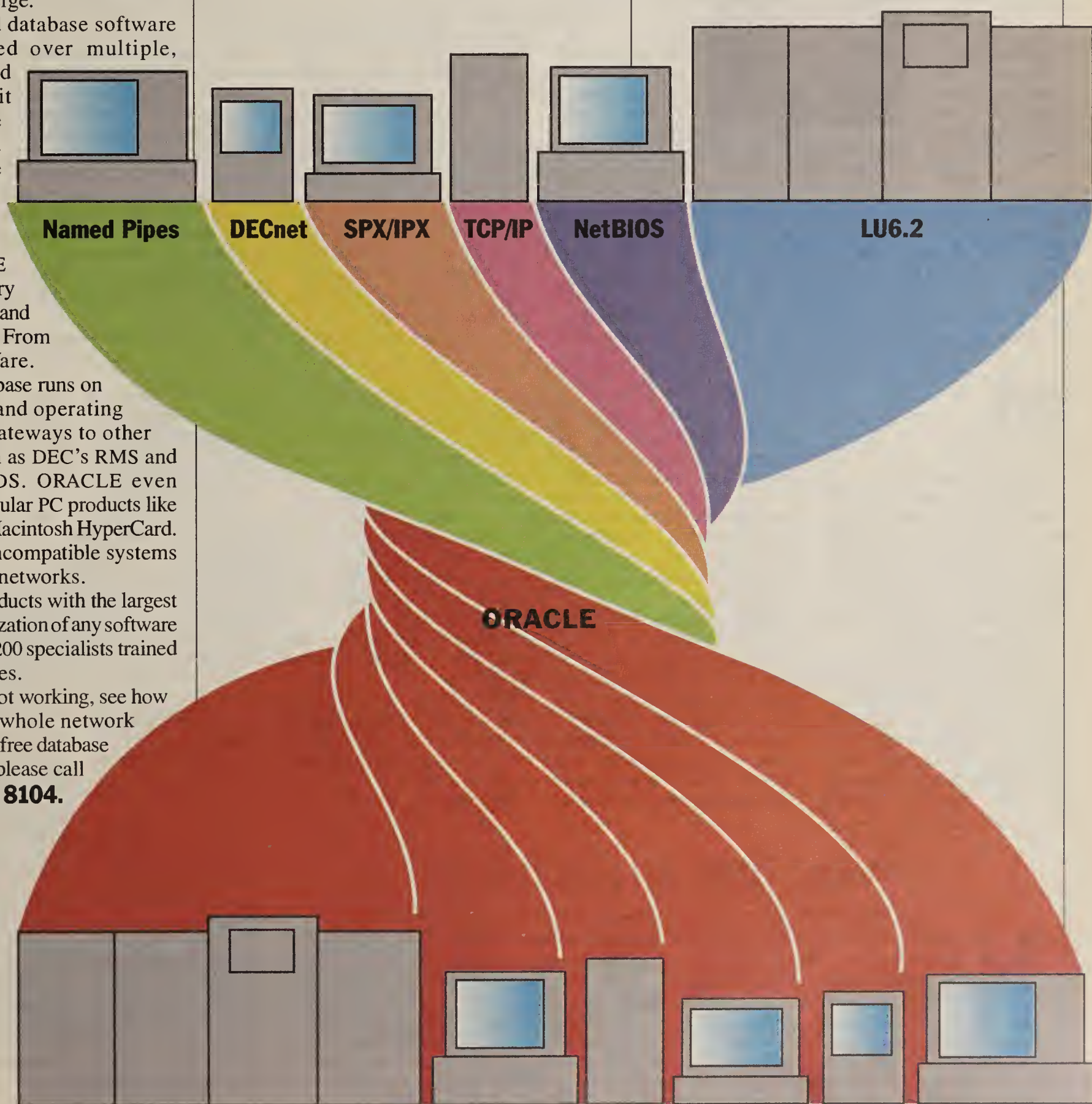
Oracle's network and database software makes data distributed over multiple, incompatible networks and computers appear as if it were a single database on a single computer. So users can get the information they need without having to know where it comes from.

This is because ORACLE works with virtually every network protocol, media and network operating system. From LU6.2 to DECnet to NetWare.

And the ORACLE database runs on every major computer and operating system. It also offers gateways to other major data sources such as DEC's RMS and IBM's DB2 and SQL/DS. ORACLE even supports access from popular PC products like Lotus 1-2-3, dBASE, and Macintosh HyperCard. So companies can turn incompatible systems into a unified network of networks.

Oracle backs all its products with the largest service and support organization of any software company, including over 200 specialists trained to handle networking issues.

If your networking is not working, see how one twist can turn your whole network around. To sign up for our free database conference in your area, please call **1-800-633-1071 ext. 8104.**



**ORACLE®**

Compatibility • Portability • Connectability

# Dial 1-800... for Bellsouth 'secrets'

BY MICHAEL ALEXANDER  
CW STAFF

CHICAGO — The attorney for Craig Neidorf, a 20-year-old electronic newsletter editor, said last week that he plans to file a civil lawsuit against Bellsouth Corp. as a result of the firm's "irresponsible" handling of a case involving the theft of a computer text file from the firm.

Federal prosecutors dismissed charges against Neidorf four days into the trial, after prosecution witnesses conceded in cross-examination that much of the information in the text file was widely available.

Neidorf, the co-editor of "Phrack," a newsletter for computer hackers, was accused by federal authorities of conspiring to steal and publish a text file that detailed the inner workings of Bellsouth's enhanced 911

emergency telephone system across nine states in the Southeast [CW, July 30].

"What happened in this case is that the government accepted lock, stock and barrel everything that Bellsouth told them without an independent assessment," said Sheldon Zenner, Neidorf's attorney.



Ralf-Finn Hestoft  
**Neidorf may sue for 'irresponsible' trial effort**

One witness, a Bellsouth service manager, acknowledged that detailed information about the inner workings of the 911 system could be purchased from Bellsouth for a nominal fee using a toll-free telephone number.

A Bellcore security expert who was hired by Bellsouth to investigate intrusions into its computer systems testified that the theft of the file went unreported for nearly a year.

Last week, a Bellsouth spokesman said the firm's security experts delayed reporting

the theft because they were more intent on monitoring and preventing intrusions into the company's computer systems. "There are only so much resources in the data security arena, and we felt that it was more urgent to investigate," he said.

He also disputed assertions that the document was of little value. "It is extremely proprietary and contained routing information on 911 calls through our nine-state territory as well as entry points into the system," he said.

## A quick ending

The case unraveled after Robert Riggs, a prosecution witness who had already pleaded guilty for his role in the theft of the document, testified that he had acted alone and that Neidorf had merely agreed to publish the text file in "Phrack."

Neidorf and his attorney agreed to a pretrial diversion, a program under which the government voluntarily dismisses the indictment but could reinstate it if Neidorf commits a similar crime within a year.

The case has stirred up na-

tional debate on the rights of computer users in the age of electronic information. The Electronic Frontier Foundation, a civil liberties group set up by Mitch Kapor, founder of Lotus Development Corp., may participate in the filing of a lawsuit against Bellsouth, said Terry Gross, an attorney at the New

York law firm of Rabinowitz Boudin Standard Krinsky & Lieberman.

"The Electronic Frontier Foundation is concerned by the irresponsibility of Bellsouth of claiming from the outset that this was confidential material when it should have known that it was not," Gross said.

## Too much access

PENSACOLA, Fla. — A former U.S. Air Force airman, alleged to be a member of the Legion of Doom, pleaded guilty last week in U.S. District Court to possession of at least 15 access codes with intent to defraud.

Peter J. Salzman, 19, an airman at Elgin Air Force Base, used an Apple Computer, Inc. IIE to enter telephone systems operated by Bellsouth Corp., Bell Atlantic Corp. and other carriers, said Stephen Preisser, assistant U.S. attorney for the Northern District of Florida.

A device that logs outgoing calls indicated that Salzman was "burning the wires" without paying for the telephone calls, Preisser said.

The airman is alleged to be a member of the Legion of Doom, a group of hackers under investigation by federal and state authorities. Authorities searching Salzman's home uncovered correspondence that indicated Salzman was a member of the group, Preisser said.

Salzman will be sentenced on Oct. 5 and could receive a maximum of 10 years imprisonment and a \$250,000 fine.

MICHAEL ALEXANDER

## MCI

FROM PAGE 1

vendor, Hoffman said.

Chrysler Corp. recently chose MCI to provide an interstate 1.5M bit/sec. network for business and engineering data. Chrysler asked MCI to develop a knowledge-based system for automatically responding to routine network problems.

The capability being developed is a data-oriented version of MCI's Integrated Network Management Services, which is designed mostly for use with MCI's voice-based Vnet service. Heath said it will be turned into a product with general availability

within a year or so.

Heath said 70% of the MCI communications network is now geared for high-speed data communications. The balance, while able to support data transmission, does not yet have all of the reconfigurability, intelligence and fault tolerance desirable for the most demanding data applications, he said.

MCI would seem to have little choice but to jump on the data bandwagon. It lags behind archival AT&T in the breadth and depth of its data services, and its data offerings now account for less than \$1 billion of its annual revenue. Meanwhile, the market for data services is growing at 35% annually while demand for

voice rises at a 3% to 5% rate, said Berge Ayvazian, a vice-president at The Yankee Group.

"MCI has not been successful in stealing [data] market share from AT&T," Ayvazian said. That is partly because MCI's services are less mature and customers have traditionally felt more comfortable trusting their mission-critical data applications to AT&T, he said.

"We absolutely must become a full-service supplier in global markets — data and voice," Heath said. "We could be a nicely profitable, slow-growth company, but MCI's objectives are to win market share and to grow rapidly."

One Fortune 500 firm uses

MCI, AT&T and U.S. Sprint Communications Co. for its data network backbone, but it uses mostly AT&T for its low-speed, point-to-point analog and digital data circuits. The firm's director of data communications, who asked not to be named, said, "With T1, MCI and Sprint have proven very effective. But below T1, MCI and Sprint can't respond as effectively as AT&T. If AT&T says they'll be there [for an installation] on July 7, they'll be there. The ability to deliver services on time is a problem with MCI."

MCI has one of the most sophisticated data processing and networking environments in the world, Ayvazian said. "But so far, MCI has not allowed that focus to penetrate into product management. They have not taken their transaction processing expertise to market."

Heath said MCI is moving toward "universal dial tone for data," by which applications such as videoconferencing can be invoked as readily as a long-distance voice call. He said MCI will increasingly offer high-speed switched services in which customers can instantly boost transmission capacity to meet peak loads for applications such as computer-aided design and manufacturing and interconnection of local-area networks.

Some users are apparently

willing to wait for MCI to round out its data offerings. One year ago, Merrill Lynch & Co. handed MCI a \$150 million telecommunications outsourcing contract. Thomas Byrnes, telecommunications vice-president at Merrill Lynch, recently said, "MCI has shown that it is moving to a state-of-the-art network delivery. We feel we do not have to absorb the risk of buying gold technology. We say to MCI, in effect, that if something new

## At a glance

MCI looks at data-oriented services as a chance to stay on a fast-track growth path

**MCI**

Founded: 1968

1989 revenue: \$6.5 billion

1989 earnings: \$558 million

Average annual growth in revenue (1985-1989): 26.9%

Total assets: \$6.3 billion

Rank in U.S. long-distance market: No. 2

Market share (of \$55 billion market): 12%

Employees: 19,000

CW Chart: Paul Mock

## Giving 'inn' to net needs

Now that it has accumulated 133 properties under its hotel management umbrella, Prime Motor Inns, Inc. has decided to leverage its position as a large user of network services with a customized MCI Communications Corp. Vnet package.

The contract is a \$30 million, three-year exclusive agreement. Douglas Holloway, vice-president of technical services at Prime, said "substantial" savings and improved services to hotel guests were the impetus behind the deal.

Vnet is MCI's virtual network offering, a long-haul transport option that allows customers to allocate a portion of the public network between their premises and the carrier's central office to a mix of services. Virtual networks offer the channel allocation the flexibility of a private network without forcing users to make

large investments in equipment, dedicated lines and telecommunications personnel.

Prime Motor Inns in Fairfield, N.J., owns and/or operates hotels of various franchises, including Howard Johnson's, Ramada, Inc. and Holiday Inns, Inc. The firm intends to use Vnet as a dial-up network for voice and modem applications, credit-card authorizations and call accounting functions, Holloway said. Management of the network will be handled entirely by MCI.

Holloway said a contributing factor to the MCI selection was the carrier's flexibility in its billing system. He said the other two bidders — AT&T and U.S. Sprint Communications Co. — did not offer the flexibility in aggregating the billings of individual locations and sending them to a central location.

JOANIE M. WEXLER

# Develop It Once And For All

*Professional ORACLE Allows PC Developers To Build Applications For All Their Computers. Without Any Re-coding.*

Software developers can now use their PCs to create even the most sophisticated database applications and then run them unchanged on virtually any major computer system.

Everything from a standalone PC to a client-server configuration on a LAN, from a minicomputer to the largest IBM mainframe.

In fact, applications developed with ORACLE® tools and database run unchanged on over 80 different computers.

ORACLE tools give PC programmers an integrated set of application development

tools including a powerful 4GL, a screen generator, a reportwriter and a menu generator.

ORACLE tools can access data distributed over multiple ORACLE databases as well as data stored in other vendors' software such as IBM's DB2 and SQL/DS and DEC's RMS.

Oracle backs all of its products with the largest service, support and consulting group in the world.

And if you order now, Oracle will provide 30 days of free installation support plus a 30-day money-back guarantee.

Buy the Professional ORACLE tools and database for \$1299, or you can buy just the tools for \$799.

Call 1-800-ORACLE1, ext. 81A1 right away and see just how quickly and easily things develop.

**ORACLE is portable.**  
It works with  
virtually every vendor's  
hardware.

IBM  
3090

DEC VAX

DEC VT 320

SUN  
Workstation

IBM  
PS/2

Macintosh

Compaq  
486

DEC  
Station

UNIX

OS/2

VMS

MVS

dbase

LOTUS 1-2-3

Hypercard

**ORACLE is open.**  
It works with  
virtually every vendor's  
software.

Call right now  
and get 30 days of  
free phone support.  
**1-800-ORACLE1**  
Ext. 81A1

**ORACLE®**

Compatibility • Portability • Connectability

©1990 Oracle Corporation. ORACLE is a registered trademark of Oracle Corporation. All trade names referenced are the service mark, trademark, or registered trademark of the respective manufacturer. Call 1-800-ORACLE1 for hardware and software requirements.

# Expert systems make their mark in corporations

BY JOHANNA AMBROSIO  
CW STAFF

BOSTON — Expert systems are on the move again. Although the technology has not lived up to the hyped expectations of previous years, large information systems shops around the country have implemented production applications using expert systems tools.

Representatives from some 30 user organizations talked about their applications at the AAAI-90 National Conference on Artificial Intelligence, held here last week.

Eaton Corp. in Milwaukee has de-

ployed more than 20 expert systems companywide, said Michael L. Smith, a senior AI specialist at Eaton's corporate research and development group. "Our goal is to have 20,000 people using expert systems by year-end 2000," he said.

Owens-Corning Fiberglas Corp.'s expert system helps factory workers diagnose and fix problems that occur on the production line. It runs on personal computers in the factory and hooks into the corporate database. Once the system has helped diagnose the problem, a video shows the user how to fix the problem.

Sears, Roebuck and Co.'s Merchandising Group has several pilot expert sys-

tems that are slated to go into production within the next year or so. Applications include merchandising, marketing and auditing.

"We've been involved with the technology for two years," said Mike Rogalski, a Sears software specialist. "We believe the technology can be useful for us; it's not just for rocket scientists." Benefits so far include improved customer service and "flexible and responsive development tools," he said.

Themis Papageorge, corporate AI marketing director at Digital Equipment Corp., estimated that about 100 of the Fortune 1,000 firms have "mission-criti-

cal production applications that use expert systems technology. This trend started around three years ago but became significant in the last nine months."

Different factors are coming together to spearhead this trend. Robert N. Goldman, president and chief executive officer of software vendor AI Corp. in Waltham, Mass., said, "IS directors are realizing there are problems in their organizations that this technology can address. These are generally adaptive kinds of problems — implementing corporate policies and applying those rules to applications such as pricing, allocation, scheduling. Predictive technology just can't be built into the older programming tools."

The first generation of expert systems required dedicated hardware and new languages and programming methods. However, today's tools run on standard hardware and do not require programmers to go through as steep a learning curve as did older expert systems.

Technology Applications, Inc., a Jacksonville, Fla., custom software house that specializes in expert systems development, has implemented approximately 30 commercial expert systems, about 10 of which are in production. "Most of these are spearheaded by an AI champion within the company who knows about a particular need and knows that need cannot be solved with existing technology," said President Bob Touchton. "More and more, though, the philosophy is 'Just give me a solution, and use whatever technology is appropriate.'"

David Wise, a senior systems analyst at Frito-Lay, Inc., said that although expert systems software "is not yet mature and can't do everything you want it to do, it does enough. We've been very satisfied; our payback has been millions of dollars and the ability to make better decisions."

## WITH OMNIS 5, FEDERAL EXPRESS ABSOLUTELY POSITIVELY WON'T GIVE A DAMN WHO WINS THE GREAT DATABASE WARS OF THE 90s.

**We'll train you to develop SQL Server, ORACLE or DB2 mini/mainframe applications with Omnis 5<sup>®</sup> on your Windows 3.0, OS/2 or Macintosh desktop. Then we'll give you free copies of Omnis 5 to do it with.**

At least where their three dozen or so Omnis 5 relational database applications are concerned, Federal Express really won't be losing sleep over which DBMS company is going to win the *Great Database Wars of the 1990s*. No matter which SQL database *hardware or software* Federal Express uses today — or switches to tomorrow — their Omnis 5 applications investment will be intact. Because all SQL data now looks the same to Omnis 5.

**Why Pay for Mini & Mainframe Development Tools When All Your Applications Development Is Moving to the Desktop?**

Mini and mainframe applications should be developed and run interchangeably on any Windows 3.0,

OS/2 or Macintosh desktop. Your database server will do a lot less work, and you will replace expensive mainframe MIPS and tools with cheap, user-friendly, graphical desktop MIPS and tools. And you can make those mainframe DBMSs do what they could never do before: graphics.

**Now, Even ORACLE and DB2 Can Store Graphics, Courtesy of Omnis**

OMNIS 5, the sleeper product of the new decade, was just waiting for Windows 3.0 to make all desktops graphical. Now, identical SQL applications can be moved between the PC and the Mac. Effortlessly. Automatically. Without any recoding.

With a PC or Macintosh as the terminal, your mini and mainframe SQL applications can freely utilize graphical objects. And by using the SQL LONG VARCHARACTER column definition, Omnis 5 gives users the ability to store graphic images in a SQL database.

From bit-mapped photos to logos, images have been all but ignored by

mainframe data management suppliers. Why? Because most IBM and VAX terminals don't handle graphics. But with PCs and Macs sitting on almost every desk, the death of mini and mainframe development has been a revolution just waiting for Windows 3.0 and OS/2 graphical user interfaces (the Mac was already there).

**Let Us Train You Properly, and We'll Give You Both Macintosh & Windows 3.0 Software Free**

Reserve a week on our *Omnis Express Train<sup>™</sup>*, and we'll send you roaring back to work with more than just free Macintosh and Windows 3.0 Omnis 5 software, complete with SQL interface modules. You'll also have working prototype applications with which you can serve notice on the big-time DBMS vendors and their mainframe-priced tools that you're moving development to the desktop.

Your *Omnis Express Train* ticket will cost less than if you bought the software all by itself. And if you call early enough today with a credit card or purchase order number, you'll have all that free Omnis 5 software tomorrow morning. Because naturally, we'll send it via Federal Express.

**BLYTH<sup>®</sup>  
SOFTWARE**

Call toll-free 800/843-8615 (800/223-8050 in California).

© 1990 BLYTH SOFTWARE, INC. OMNIS AND OMNIS 5 ARE REGISTERED TRADEMARKS AND OMNIS EXPRESS TRAIN IS A TRADEMARK OF BLYTH SOFTWARE. THE OTHER COMPANIES' NAMES ARE THEIR TRADEMARKS. IBM

## IBM gets strategic with AI tools

BOSTON — IBM introduced a family of expert systems tools last week that spokesmen characterized as its strategic products in that arena.

The introduction took place at an artificial intelligence trade show held in Boston, where IBM demonstrated its new software, called The Integrated Reasoning Shell (TIRS). It allows developers to build applications that incorporate reasoning.

IBM will continue to sell its older expert system software, including KnowledgeTool and the Expert System Environment. However, the company's "future investments will be in TIRS," said Alex Lilley, IBM's manager of knowledge-based systems marketing. "TIRS is our multiplatform, high-performance expert systems tool."

TIRS will initially run under OS/2, AIX, MVS and VM, and all the Systems Application Architecture environments will eventually be included, Lilley said. This will allow users to develop expert systems applications on any of the supported platforms and run the application on any of the other platforms.

Links with IBM's IMS database management system and CICS are already provided, while DB2 support is on its way, Lilley added.

JOHANNA AMBROSIO

100

# Oracle Financials keep Burlington Coat comfortable year-round.

100



*"We were dying under the weight of obsolete computing. We needed an integrated financial system with a user interface that wouldn't cause a mutiny. Not only did Oracle Financials deliver over one million invoice transactions this season, but it delivered a 100% happy user base."*

Bob LaPenta, Controller and Chief Accounting Officer, Burlington Coat Factory

With over 150 stores around the country, Burlington Coat's biggest sales job was internal. Even though phenomenal growth had obsoleted their accounts payable, expenses and general ledger system, their employees knew how to use it. They knew the work-arounds and the pitfalls. They also knew the 1989 buying season would be their biggest ever. So they were willing to give the Oracle Financials™ family of products a close look.

The intuitive screens impressed them immediately, because Oracle Payables had a familiar feel. But they were literally rescued by the ability to modify vendor information on the fly. For example, their suppliers may have financed production with multiple lenders, or factors, who needed to be paid directly. Oracle Payables easily accommodated this, thereby eliminating the work-

arounds, manual entries and overtime that had become a way of life.

A successful season and a million invoices later, Burlington Coat keeps their business warm with Oracle Financials.

Find out how the complete suite of Oracle Financials products—Oracle General Ledger, Oracle Purchasing, Oracle Payables, Oracle Assets, Oracle Receivables, Oracle Revenue Accounting, Oracle Inventory, Oracle Order Entry, Oracle Sales Analysis, Oracle Personnel, Oracle Alert—can keep your business out of the cold. They're so easy to learn and use, you can probably use our documentation to warm your own house.

## ORACLE®

Call 1-800-ORACLE1, ext. 8195 today, to schedule a demonstration of Oracle Financials. The experience will be a profitable one for you.

# Oracle Financials

100

100

## U.S. FINANCIALS SEMINARS

AL	Birmingham	.....	Sep 5
AZ	Phoenix	.....	July 24
	Tucson	.....	Aug 7
CA	Los Angeles	..... July 31	Aug 21
			Sep 20
	Newport Beach	... July 17	Sep 18
	Riverside	.....	July 12
	Sacramento	.....	July 26
	San Diego	..... July 17	July 19
			Sep 13
	San Francisco	.....	Aug 9
	Santa Clara	.....	Aug 17
	Woodland Hills	.....	Sep 27
CO	Denver	.....	July 19
CT	Stamford	.....	July 24
DC	Washington	.....	Aug 7
FL	Jacksonville	.....	July 19
	Orlando	.....	Sep 20
	Tampa	.....	July 13
GA	Atlanta	..... July 10	Sep 11
HI	Honolulu	.....	Sep 20
IL	Chicago	.....	Aug 2
IN	Fort Wayne	.....	July 24
KY	Louisville	.....	Aug 23
LA	New Orleans	.....	Sep 12
MA	Burlington	.....	July 27
	Springfield	.....	Sep 25
MD	Baltimore	.....	July 19
	Bethesda	.....	Sep 20
MI	Dearborn	.....	Aug 21
MN	Minneapolis	.....	Sep 11
MO	Kansas City	.....	Aug 2
	St. Louis	.....	July 19
NC	Res Tri Park	.....	Sep 13
NE	Omaha	.....	Sep 17
NJ	Iselin	..... July 10	Sep 9
NM	Albuquerque	.....	July 26
NY	Buffalo	.....	July 24
	New York	..... July 11	Sep 12
	Rochester	.....	Sep 11
	Syracuse	.....	July 26
OH	Cincinnati	.....	Sep 13
	Cleveland	.....	July 5
	Columbus	.....	Aug 16
OK	Oklahoma City	.....	July 18
	Tulsa	.....	July 19
PA	Harrisburg	.....	July 19
	Malvern	.....	Aug 21
	Philadelphia	.....	Sep 25
RI	Providence	.....	July 12
SC	Columbia	.....	Sep 13
	Greenville	.....	July 18
TN	Nashville	.....	Aug 7
TX	Austin	.....	Aug 15
	Dallas	..... July 11	Sep 12
	Houston	..... July 17	Aug 21
			Sep 18
	San Antonio	.....	Aug 16
UT	Salt Lake City	.....	July 17
VA	Reston	.....	July 17
WA	Bellevue	..... July 24	Aug 23
	Seattle	.....	Sep 12
WI	Madison	.....	Aug 15
	Milwaukee	.....	Sep 6

## CANADIAN FINANCIALS SEMINARS

For registration call (800) 668-8926, except in Quebec, call (514) 633-9900

Edmonton	.....	Aug 9
Toronto	.....	July 17
Vancouver	.....	Sept 13

Please note:

\* These seminars are held for the Federal Government only.

Attn: National Seminar Coordinator  
Oracle Corporation  
20 Davis Drive  
Belmont, California 94002  
1-800-ORACLE1, ext. 8195

☐ My business card or letterhead is attached. Please enroll me in the FREE Oracle Financials seminar to be held

at: \_\_\_\_\_

on: \_\_\_\_\_

COMPWORLD

# Ashton-Tate puts credibility on the line with upgrade

BY JAMES DALY  
CW STAFF

TORRANCE, Calif. — The rules of baseball do not necessarily apply to the software development business. Screw up the release of an important program a second time, and it could be two strikes,

"yeeeeer out!"

So when Ashton-Tate Corp. officials pulled the curtain back on a debugged and revamped Dbase IV Release 1.1 last week, not only were 18 months of re-development efforts and the fortunes of thousands of users on the line, but analysts said the

company's financial future was also hanging in the balance.

"There's been a lot of pressure on us, but I think this time we got it right," said Joe Budge, Dbase product development manager.

Release 1.1's predecessor was a failure of spectacular pro-

portions, which tended to crash spontaneously because its memory management was so bad. It was lambasted in the press and tipped the company toward four quarters of red ink.

Whereas some firms might have chained their programmers to their desks and subjected

them to ungodly working hours in a rush to get the program out the door, Budge said he knew that slow and steady was the way to win this race. "We knew it was not going to be an overnight process," Budge said of the re-writing efforts, which began in early 1989. "The priority was to do it correctly, not cut corners to just get software out."

Although Budge would not comment on the problematic Release 1.0 development effort because of pending litigation, he said new procedures were used to create Release 1.1 because "Dbase became far too complex for traditional PC [application development] methods."

Budge said his team needed to tweak the rules of personal computer software development at first because they wanted to bring minicomputer- and mainframe-level testing procedures to the new releases. "Minis and mainframes frequently use emulator environments where they throw software against the emulators and run automated tests like there is no tomorrow," he said. "That's not done on a PC."

The team put together a network of several minis driving a series of PCs to accomplish the same thing, Budge said, and created an environment in which the PC was an extension of the mini. The new version would be able to be tested on a number of platforms, including OS/2, Unix, Digital Equipment Corp. VAX/VMS, DOS Extender, DOS and Apple Computer, Inc.'s Macintosh environment.

Development and testing of software is inherently a complex process. Dbase IV Release 1.1 is no exception: It consists of 500,000 lines of code that control more than 440 commands and functions. New code needed to be carefully incorporated into constantly updated prerelease versions of the software, called baselines, to avoid triggering new problems elsewhere, called a regression.

Code was often developed in chunks, each of which represented a different part of the product, Budge said. Once a new code module was ready to test, an elaborate series of safety checks kicked in.

A significant new testing addition was a phase called pre-integration testing (PIT), which allowed code to be comprehensively tested before integrating it into the baseline. A PIT crew built an executable version of the module and incorporated it into a simulated Dbase IV environment. Tests were then run until the module passed and was incorporated into a new baseline or was returned to the development team for improvements.

Beta testers also received a progression of Dbase IV Release 1.1 builds, tested them in real life and shipped their reviews back to Ashton-Tate scientists.

## MULTI-LEVEL



### Multi-Tech LAN Solutions

#### Your one-stop source for LAN technology

Multi-Tech introduces LAN systems for any level of networking, optionally bundled with Novell® NetWare®. We provide a variety of Arcnet® and Ethernet® hubs and interface cards, featuring the new EN512TP 12-port twisted pair Ethernet hub. We also offer the RS232LAN, the low-cost solution for small workgroups.

#### LAN systems from a familiar face

For nearly twenty years, Multi-Tech has been a dependable name in modems, multiplexers and other wide area networking technologies. And as LAN technology moves to new levels of connectivity, you can continue to count on Multi-Tech.

For more information, call us at 1-800-328-9717.

Seeking the highest level in data communications? Multi-Tech delivers a full line of products, including modems, statistical multiplexers, LAN systems and 3270 emulators.

**MultiTech®**  
Systems

The right answer every time

Multi-Tech Systems, Inc.  
2205 Woodale Drive  
Mounds View, Minnesota 55112 U.S.A.  
(612) 785-3500 (800) 328-9717  
U.S. FAX (612) 785-9874  
International Telex 4998372 MLTTC  
International FAX (612) 375-9460

SEE US AT

**NETWORLD90™**

SEPTEMBER 11-13 • DALLAS



## This isn't the only way to join two different systems.

It took 28 years and a lot of sledgehammers for this barrier to come down. Bringing two very different systems together as one.

Now, Software AG has a way to do the same for yours.

With our NATURAL application development environment, we give you something you've never had before: freedom. The freedom to choose the

hardware vendor that works best for you. Whether it's IBM, Digital, Wang or Siemens. The freedom to change systems, anytime, with no loss of investment in your applications. And the freedom to exchange ideas and information among all your offices. Across all your systems.

So whatever system you work under, IBM, DEC, Communist or Capitalist, NATURAL has a way to unite them all

into one powerful force. For more information, call 1-800-843-9534. (In Virginia, call 703-860-5050; in Canada, call 519-622-0889.)

## Your success is how we measure ours.



# Compaq fights notebook PC pressure with lower prices

BY RICHARD PASTORE  
CW STAFF

A recent wave of price cuts in notebook-size portable computers culminated last week as

Compaq Computer Corp. cut prices of its market-leading LTE for the first time. The cuts indicated that the pricing structures of first-tier notebook vendors are starting to crack in the face

of mounting competitive pressures, observers said.

Compaq cut the prices of its Intel Corp. 8088-based LTEs by 10% to 16%, bringing the cost of the Model 1 below the \$2,000 mark. It also reduced the prices of the LTE/286 line by 12% to 16%.

Compaq's move follows cuts by fellow portable leaders NEC Technologies, Inc. and Toshiba

America Information Systems, Inc. NEC knocked 33% to 36% off the prices of its Ultralite notebook personal computers last month. In June, Toshiba reduced prices across its line by 6% to 16%.

The reductions are largely a case of the big boys swatting at the swarm of new, low-priced gnats, observers said. Aggressive new players have "caused

these vendors to sit up and take notice," said Richard Horan, editor of "Portable Technology Update" in New York.

A typical example is Chicago-based Airis Computer Corp., which announced a \$1,900 full-function notebook computer in June. Others are on the way, particularly from the Far East. "There are products coming from Hong Kong and Taiwan running under \$2,000," said Peter O'Connor, president of Laptop Expositions in New York.

Compaq appears to be somewhat "worried about their market share and the ability of clone machines to offer an attractive alternative to their systems," said Stephen Rood, manager of microcomputer technology at Coopers & Lybrand in New York.

Indeed, Compaq North America President Mike Swavely said the price reductions were initiated to "maintain our notebook market leadership."

**T**HE portables have lost their magic — it's now a real product affected by real laws of supply and demand."

RICHARD HORAN  
"PORTABLE TECHNOLOGY  
UPDATE"

Such moves were not necessary a year ago, when notebook PCs were such a novelty that users were willing to pay almost any price, observers agreed. That is no longer the case.

"The portables have lost their magic — it's now a real product affected by real laws of supply and demand," Horan said.

In addition, users are demanding and receiving lower, more "real" prices. "We're into austere times," Rood said. "We're more interested in the bottom line than in trying to buy something because it's a novelty."

"The downward price pressure has been tremendous," added Claude Rankin, manager of MIS at the New York office of Deloitte & Touche.

Price is becoming one of the few distinguishing selling points remaining in notebook PCs. Because most users desire transparent compatibility with their desktop PCs, they tend to favor laptops with standard, vanilla features rather than innovative technologies, according to Horan.

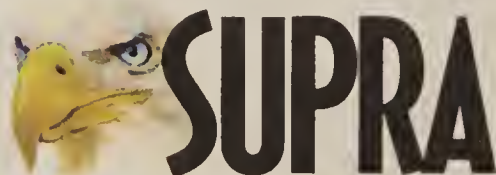
Despite tighter finances in corporate America, notebook systems trail only Intel 80386SX-based boxes as the fastest selling PCs this year, according to Dallas-based Storeboard/Computer Intelligence, a Dallas firm that charts sales through U.S. computer stores.

# TRUER BLUE.



NO RISK SUPRA TRIAL.  
SEE BLUE IN A WHOLE NEW LIGHT.

Cincom's SUPRA® High Performance SQL Relational DBMS is now SAA compliant in all VM and MVS environments as well as VSE. It also runs on VAX™ and UNIX®. Better yet, it's the most powerful DBMS around. Because applications built using SUPRA are DB2 compatible, you can implement relational systems today using SUPRA in your existing environment and run with DB2 later without conversion. So now you can go SAA without spending a blue million. Call today for more information.



High Performance Relational DBMS  
800-543-3010/513-661-6000 Ohio/800-268-9279 Canada



The Most Experienced DBMS Company In The World

© 1990 Cincom Systems, Inc. VAX is a trademark of Digital Equipment Corporation. UNIX is a registered trademark of AT&T Corporation.

# Now Your Company's Islands of Information are Within Easy Reach.

## Announcing the SAS® System's Transparent Data Access

If you spend more time getting *to* your data than getting information *from* your data, it's time you got the SAS System—the world's #1 applications system. No other software makes it so easy to reach all the remote islands of information within your company—or to analyze and present data in so many different ways.

The SAS System's exclusive Multiple Engine Architecture lets you access data stored in a variety of structures across a wide range of hardware platforms . . . without having to know data base terminology or sacrificing data

base security. Easy-to-follow menus take you inside DB2, SQL/DS™, ORACLE®, Rdb/VMS™, Lotus 1-2-3®, dBASE®, SYSTEM 2000®, and other data bases. What's more, the SAS System's support of SQL™ gives programmers a standard language for data query. You can also use the SAS System to access raw data files in any format—even files with messy or missing data.

Once you've accessed your data, the SAS System's integrated data analysis, reporting, and graphics capabilities will help you turn bare facts into meaningful business information. Choose from such applications as forecasting . . . operations research . . . project management . . . quality improvement . . . and more. All backed by expert technical support, consulting services, documentation, and training—direct from SAS Institute Inc., one of the world's most respected names in software.

Call us now at (919) 677-8200 to receive your free SAS System executive summary . . . plus details about a free no-risk 30-day software trial. In Canada, call (416) 443-9811.

**The SAS® System.  
More Choices  
for More Applications  
than Any Other Software.**



The SAS® System

SAS Institute Inc.  
Software Sales Department  
SAS Circle □ Box 8000  
Cary, NC 27512-8000  
Phone (919) 677-8200  
Fax (919) 677-8123

The SAS System runs on mainframes, minicomputers, workstations, and personal computers.

SAS is a registered trademark of SAS Institute Inc. Other brand and product names are registered trademarks or trademarks of their respective holders.

Copyright © 1990 by SAS Institute Inc.  
Printed in the USA.

ACCESS: Create Descriptor  
Locals Globals Help

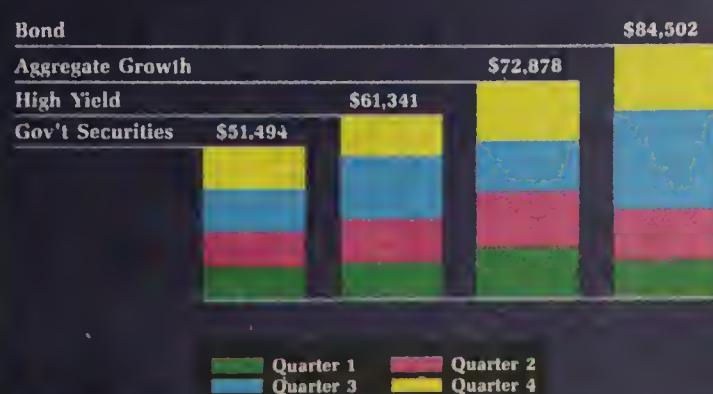
DB2 View Descriptor Display Window

Desc. ptor: Library: DBACCESS Member: FINANCE Type: VIEW  
Output SAS Data Set: Library: Member:

Authorisation ID: MXTSEM Table Name: FINANCE SSID: DB2

Func	Sel	Column Name	SAS Name	Format
-	-	YEAR	YEAR	\$4.
-	-	FUNDS	FUNDS	\$24.
-	-	JANUARY		14.2
-	-	FEBRUARY		14.2
-	-	MARCH		14.2
-	-	APRIL		14.2
-	-	MAY		14.2
-	-	JUNE		14.2
-	-	JULY		14.2
-	-	AUGUST		14.2
-	-	SEPT		14.2
-	-	OCTOBER		14.2
-	-	NOVEMBER		14.2
-	-	DECEMBER		14.2
-	-	QUARTER1	QUARTER1	14.2
-	-	QUARTER2	QUARTER2	14.2
-	-	QUARTER3	QUARTER3	14.2
-	-	QUARTER4	QUARTER4	14.2

Quarterly Investment Returns

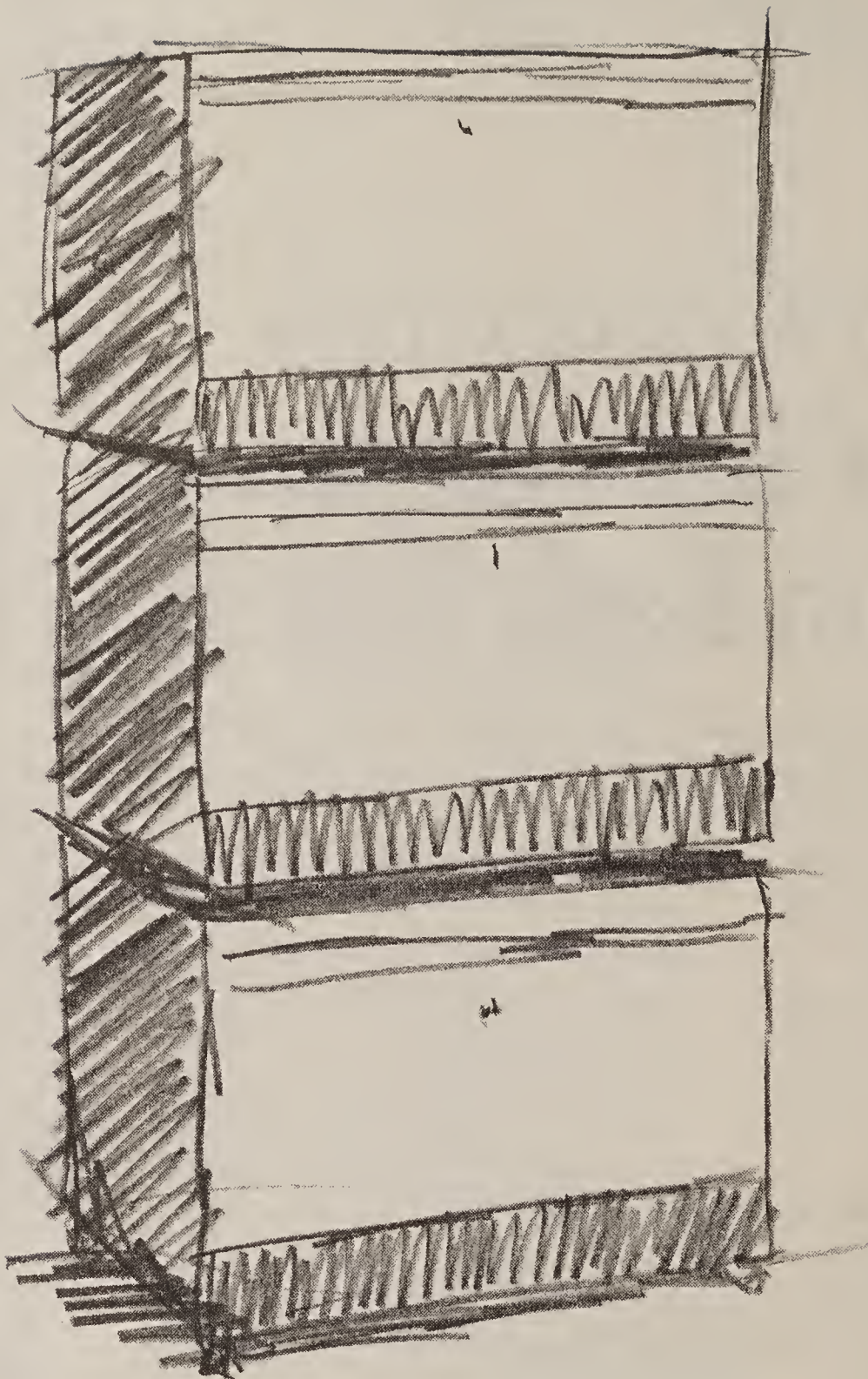


SYSTEM 2000

10x15/14

373

San



403  
1540

↓  
575

Others may copy our DEFINITY system, but they can't copy what's behind it.

San

||

403  
1540  
575

San

y = 0 = 02

The AT&T DEFINITY®  
Communications System



*It all began  
right here.*

has attracted an  
avid following  
since its debut  
just a year ago.

Customers study its ability  
to grow, to end obsoles-  
cence, and to protect criti-  
cal telecom investments.  
Competitors just study it.

**Our secret? People.**

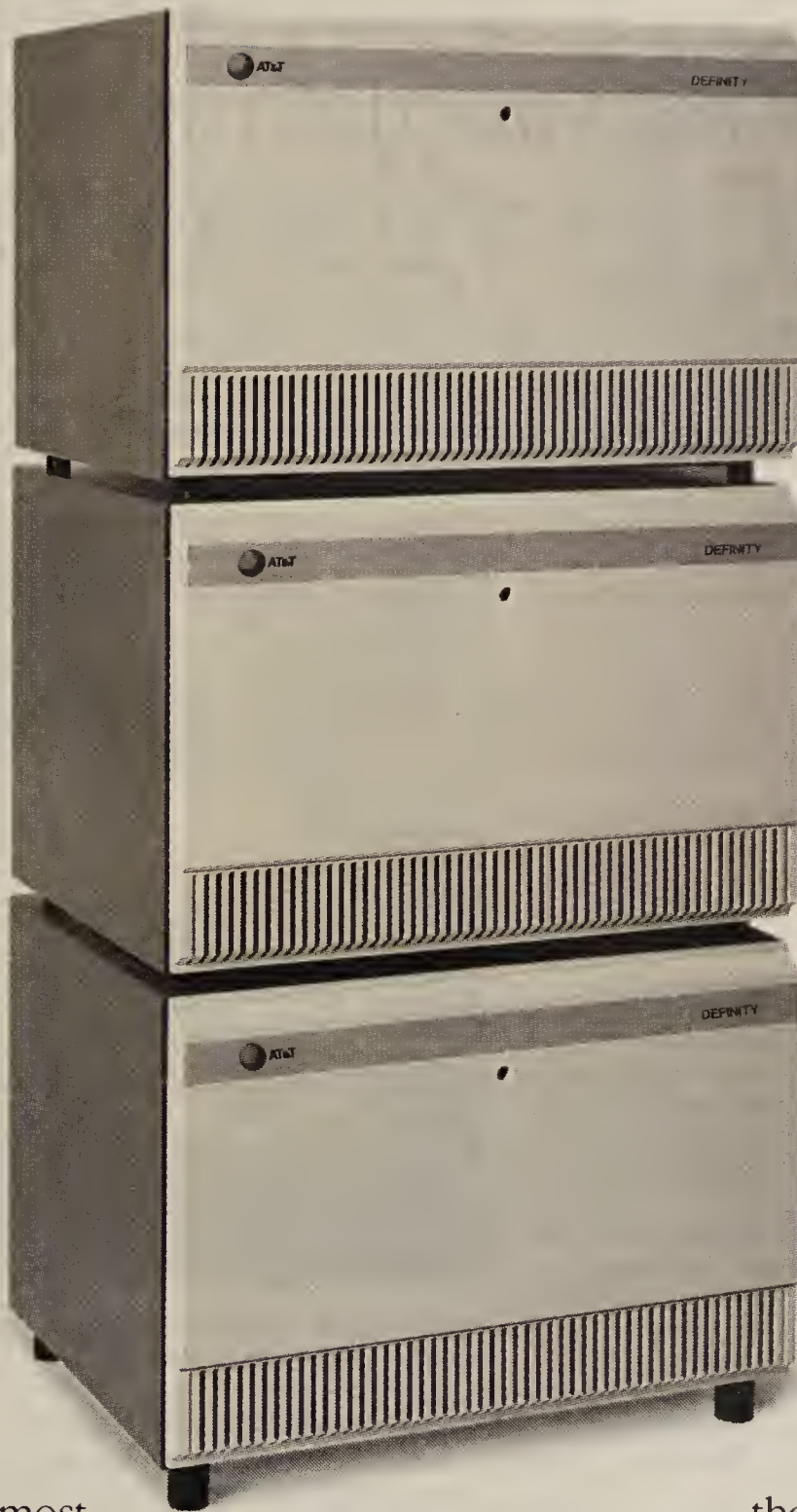
The modular DEFINITY sys-  
tem is an offspring of  
AT&T Bell Laboratories,

born of the  
brightest, most  
innovative R&D  
minds in the  
entire world.  
Behind each

system stands  
the largest sup-

*AT&T designers built  
critical ISDN technology  
into the system.*

port battalion in our industry—  
over 13,000 experts in  
Manufacturing, Product  
Design, Sales, Customer



*The modular DEFINITY system grows  
from 40 to 30,000 lines, and beyond.*

Service, AT&T Credit Corpora-  
tion, and other specialties.

**We never sleep.** Many of  
our people work through the  
night, every night. They can

monitor the condition  
and performance of  
your DEFINITY system

remotely, 24 hours a day.  
We also offer an around-the-  
clock repair line.

**But what if...** Wizards  
at our Remote Maintenance  
and Testing Service torture

*Our RMATS  
staff is  
always  
thinking*



DEFINITY software, fixing  
things that you didn't even  
know needed fixing.

The people behind  
our DEFINITY system make  
it superior. They also guarantee  
that it can never be duplicated.  
To learn more, contact your  
AT&T Account Executive or call  
us at 1 800 247-1212, Ext. 362.



**AT&T**

The right choice.

# ADVANCED TECHNOLOGY

## TECH TALK

### Lightning computing

■ Researchers at MIT have developed a technique that may make it possible to produce switches for optical computers at lower cost than was previously thought possible. Optical switches require expensive crystals and other materials that react to certain intensities of light. Scientists have hit on a process to make "microclusters" that could be substituted for the more costly materials. Microclusters are ultra-small particles — only 10 atoms wide — of semiconductor materials that fit inside plastic molecules.

### Handwriting database

■ The National Institute of Standards and Technology (NIST) has developed what it claimed is a first-of-its-kind database containing more than 1 million handprinted characters. The database is being used to help measure the performance of computer systems designed to recognize handprinted letters and numbers. Developing a standardized way of measuring the performance of character-recognition systems is a big step toward finding ways to objectively and rigorously test recognition software, NIST said. Researchers at NIST have also developed algorithms based on neural network technology that can be used on a parallel computer to recognize characters.

### SPECTacular results

■ The Systems Performance Evaluation Cooperative (SPEC) last week announced the latest benchmark results for 18 workstations and servers, including its first results for computers from AT&T and Intel Corp. The results were generated by running Release 1.0 of the SPEC Benchmark Suite, a collection of engineering and scientific benchmarks. The third-quarter results will be published in the "SPEC Newsletter," the cooperative's quarterly publication, which features performance data for machines from SPEC members.

## Packing your data in — and fast

*New storage technology promises incredible retrieval speed and space-saving ability*

BY RICHARD PASTORE  
CW STAFF

**S**kulls, eyeballs and busts of Elvis seemingly protrude in three dimensions from glass frames. For most of us, these are typical holograms — 3-D images created by split beams of light. But the folks at Microelectronics and Computer Technology Corp. (MCC) have no time for Elvis; they are applying holographic techniques to create a new generation of computer data storage that could blow away the standard Winchester disk drive.

Holographic storage, which uses laser light to record data on light-sensitive crystals, will potentially yield access speeds that are 100 times greater than those of magnetic disk drives. Also, because data is stored and retrieved in "pages" of up to 100,000 bits rather than one bit at a time, transfer rates of 100M to 800M byte/sec. will be possible. Today's top-of-the-line magnetic drives manage about a 4.5M byte/sec. transfer rate.

The need exists for such a radically new storage technology, the Austin, Texas-based researchers at MCC argued. Image processing, high-bandwidth fiber-optic networks and faster processing speeds are all putting greater demands on I/O, explained Jerry Willenbring, program manager of the project.

"From the 1950s right up to today, one of the major problems in the design of any computer system is mass storage I/O," Willenbring said. While CPU processing speeds have increased one hundredfold since 1980, disk device performance has only improved by a factor of three. The limitations are inherent in the moving parts — the spin-

ning of the disk and the tracking of the drive head, he said.

"If you've got something that has the capacity of a disk drive but is a hell of a lot faster, people will jump on it in a minute," Willenbring said.

A diverse group of anonymous



James Minor

**Co-inventor Steve Redfield holds model of holographic storage device**

industry players has done just that, teaming up to sponsor development of this core technology for which MCC received its first U.S. patent this summer. The researchers have promised their backers a prototype demonstration in two years and said they envision a commercial product in three to six years. No other laboratory in the U.S. or Japan is delving as deeply into holographic storage, Willenbring said.

MCC has had to overcome several

obstacles in the four years it has already spent on the project. The most basic was finding the proper materials. The group has worked closely with the Center for Materials Research at Stanford University to create crystal fibers with diameters small enough to be commercially cost-effective.

Indeed, cost is one of two major drawbacks of the technology. MCC estimated that prices for quantity prototype units will cost \$4,000 per 2G bytes of storage capacity. By 1995, the group hopes to bring the cost down to twice that of comparable magnetic or optical devices.

The second drawback is the relative lack of longevity of data stored on the crystals. "On magnetic disk, you can pretty well be sure that a couple of years from now the information is still going to be there," Willenbring said. "With this material, we can't be assured of that."

Consequently, MCC's brainchild is not intended for long-term, archival data keeping. Rather, it will complement magnetic and optical storage as the best-suited technology for ongoing, dynamic applications that require lightning-fast access and transfer rates.

Holographic storage should be a boon to applications that arise with high-definition video and audio technology, such as real-time image processing, transaction processing and multimedia applications, Willenbring said. The devices will likely appear first on supercomputers and large database machines, he added.

The technology's lack of moving parts adds the benefits of reliability and durability. Holographic storage devices would be ideal for systems located in harsh environments such as on-board aircraft, spacecraft or military vessels and manufacturing lines.

## Smart glass shatters traditional technology

BY MICHAEL ALEXANDER  
CW STAFF

**A** team of U.S. scientists at Isotec Limited Partnership in Tucson, Ariz., has hit on a way to manufacture "smart" glass and lenses that they said could revolutionize computing, telecommunications and traditional uses of optical technology.

Smart glass, which is made from gradient refractive index (Grin) material, can be used to control light beams precisely as well as to allow several functions to be performed by a single piece of material.

The technology could be used in the manufacture of optical computers, in which photons traveling at the speed of light would replace electrons in optical

integrated circuits, said Richard Blankenbecler, head of the theoretical physics group at the Stanford Linear Accelerator Center and an Isotec consultant.

"When transistors were developed, the necessary basic material was silicon of the right quality and purity," Blankenbecler said. "I look upon this optical development as a fairly large step in the development of the basic material that will be used to make optical integrated circuits."

Smart glass could also be used in lenses for lasers and fiber-optic cables, he said. The light pulses generated by laser could be stronger and less susceptible to error as well as travel longer distances before decaying, Blankenbecler said.

The Isotec process organizes the

atoms by which glass is made into specific patterns so that light traveling through the lens follows a designated path.

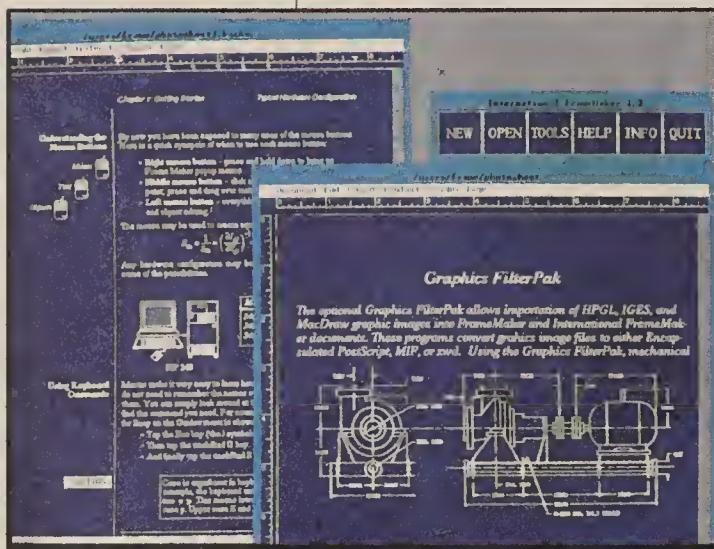
A smart glass lens consists of a stack of several layers of glass powder that has been heated to a temperature determined by the powders used and then cooled at a controlled rate.

The process is similar to current methods of making glass and is thus relatively inexpensive, Blankenbecler said. The breakthrough was in learning how to precisely heat and cool the stack of glass powders, he said.

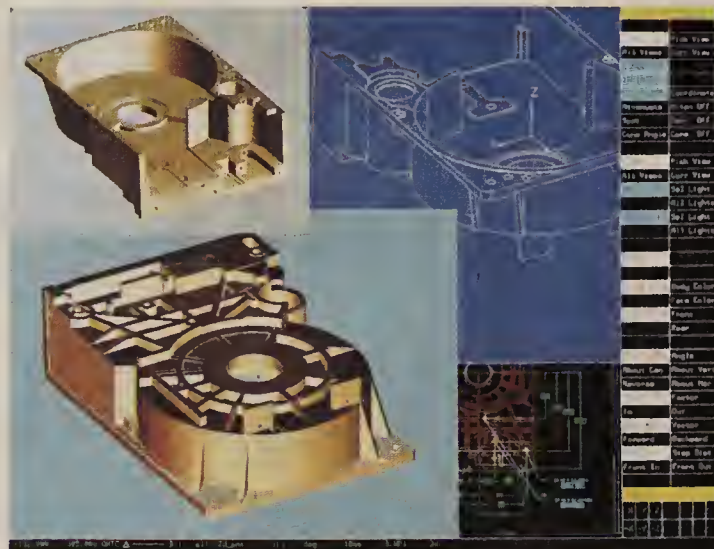
Isotec developed the process in four years at a cost of \$6 million, beating several larger and better funded companies that were also working on developing glass using Grin materials, President Leslie Danziger said.

HP and Apollo  
proudly announce  
the birth of  
five new  
workstations.

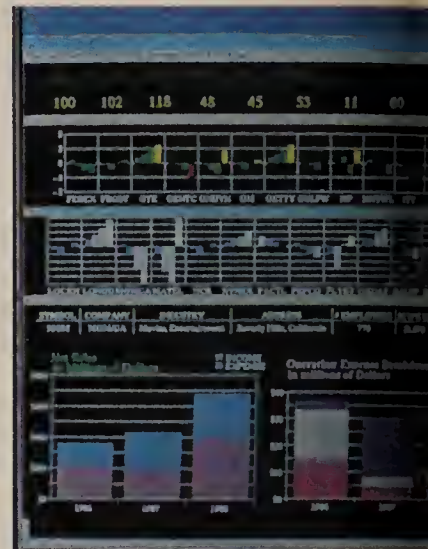
# As you'd expect, compatibility runs in



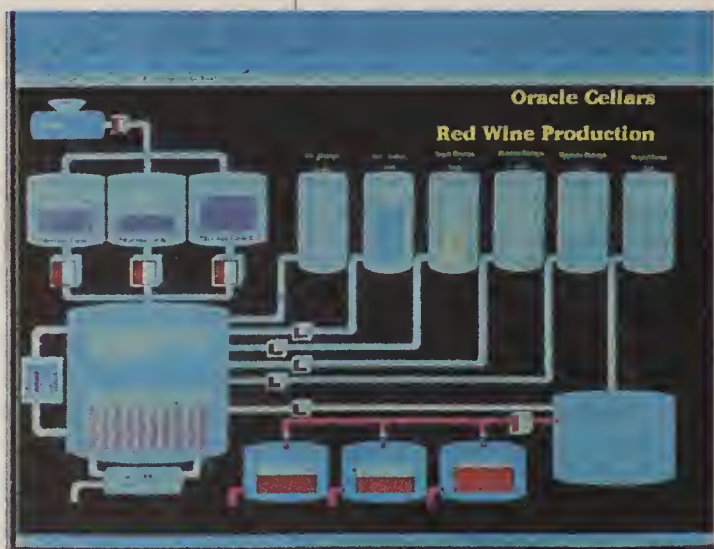
*Documentation*



*Solid modeling for mechanical engineering*



*Graphic information*



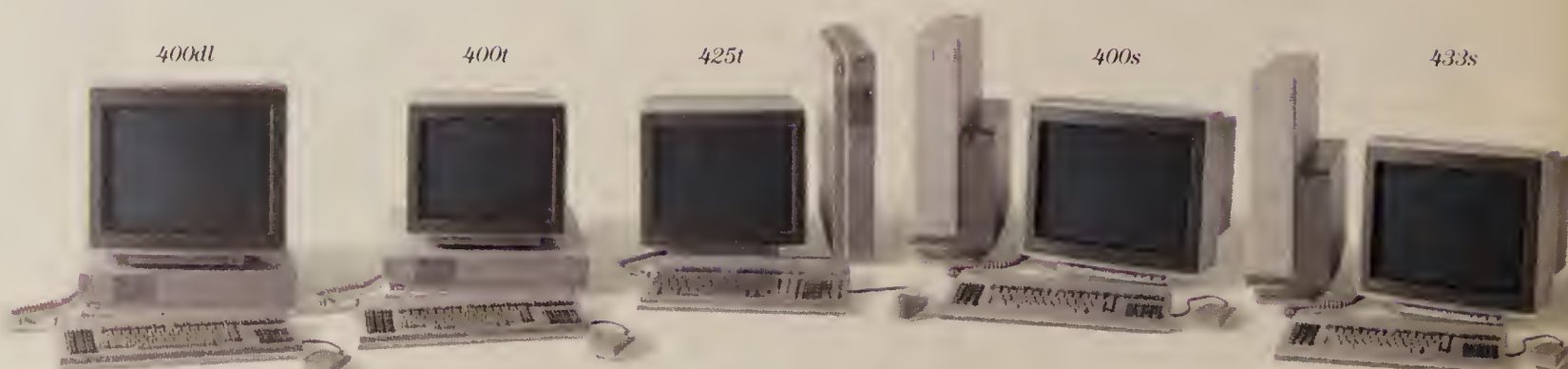
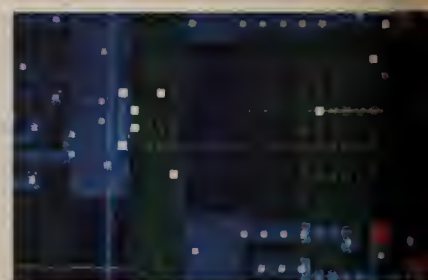
*Graphic information system*



*Advanced 3D graphics*



*Mechanical computer-aid*

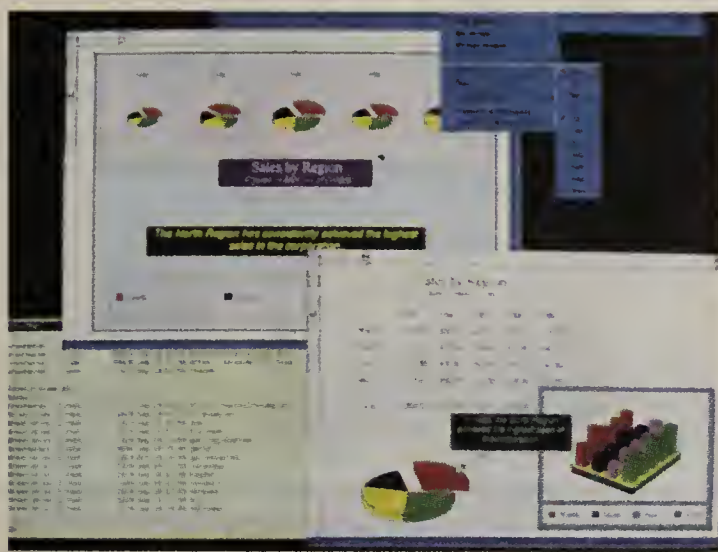


*The HP Apollo 9000 Series 400.*

# the family.



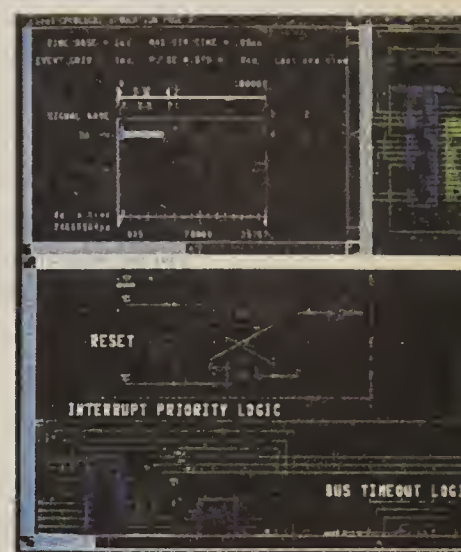
system



Presentation spreadsheet



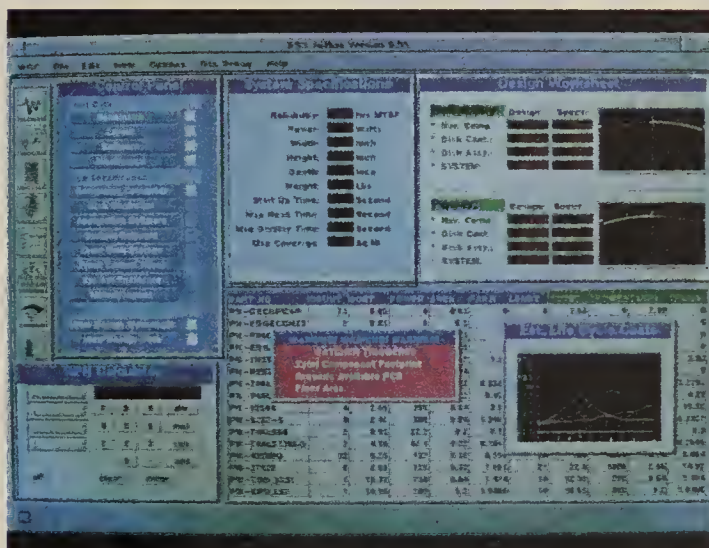
Mechanical CAD and manufacturing



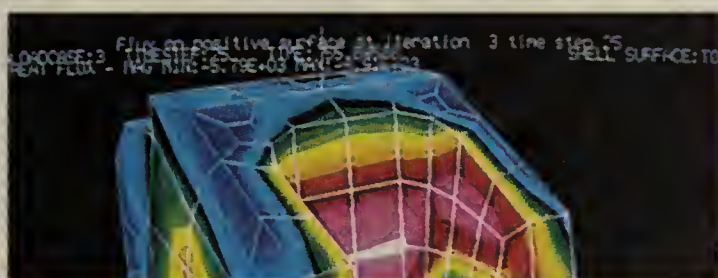
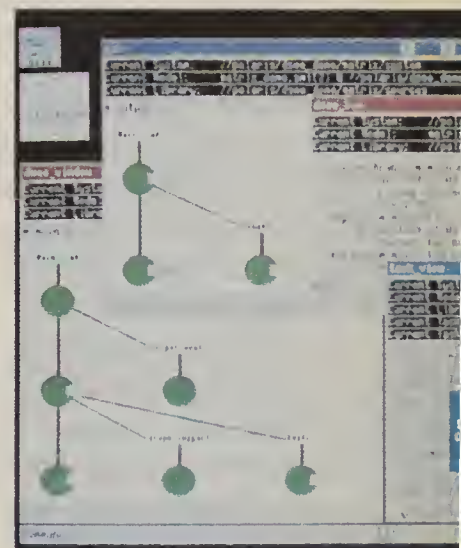
ed engineering



CASE configuration management



Electronic design automation



You're ready for more powerful workstations. But you want them at a reasonable price. And you don't want to sacrifice your software investment to get them.

Hewlett-Packard has a better way.

The new Hewlett-Packard Apollo 9000 Series 400 workstations. Based on the latest Motorola technology, they give you astonishingly fast performance at a very low price. As well as the capability to handle over 3200 applications, the

broadest and best set of applications available.

At the entry level, there's the very powerful 400dl with 12 MIPS for under \$5,000.\* The 425t with 20 MIPS and 3.5 MFLOPS is priced under \$9,000.\* And, there's the affordable 433s, with 26 MIPS and 4.5 MFLOPS for under \$16,000.\*

Our new VRX graphics options offer you excellent performance for 2D graphics with X Windows. Or add the unparalleled power of our advanced 3D graphics for the best rendering technology in the industry.

The affordable, compatible new generation of Hewlett-Packard Apollo workstations. Just the kind of innovation you'd expect from HP Apollo. For more information, call 1-800-752-0900, Ext. 1457.

There is a better way.



\*U.S. list price.  
©1990 Hewlett-Packard Company CPWG002

## EDITORIAL

## Global challenge

**T**HE FEDERAL GOVERNMENT'S decision to break up AT&T seven years ago must surely be counted as one of the greatest enablers of competition and most significant catalysts of innovation in business history.

If you want proof of this, just ask any number of information systems chiefs, some of whom spend up to half of their budgets on communications outlays. For them, the breakup resulted in steadily declining communications unit costs, communications contracts specially designed for big customers, a flood of new services and other benefits from the one thing that was so sorely needed yet was so sorely lacking for decades: competition.

Recently, U.S. Sprint, the third horse in a three-horse long-distance race, stumbled badly, suffering a \$42 million quarterly loss. While the company has dismissed the loss as an aberration, communications analysts have started wondering whether Sprint has the right stuff to go the distance with AT&T and MCI. At a minimum, the firm has to rethink its marketing strategy.

Analysts pointed to AT&T's recent service hikes, the first since the company shed its local operating companies, as evidence that competitive pressures on AT&T are waning and that the industry is headed toward a lopsided oligopoly. These kinds of concerns will undoubtedly bring out the worst in the pro-regulation crowd, who will clamor loudly for a review of competitive restrictions on AT&T that have been eased in the last few years. That's the old baby-with-the-wash-water mentality.

The massive long-distance market is not for the faint of heart or light of wallet. This means that it's unlikely you'll ever see five or six domestic companies competing for a slice, as the costs of entering the market and sustaining operations "naturally" limit entry.

However, the impact on pricing and innovation in an oligopolistic or quasi-monopolistic situation can't be ignored either. As a monopoly, AT&T was a bloated, overweight entity for which innovation was a struggle, funded by the public through a cost-plus rate structure.

Clearly, the way to ensure that customers reap the benefits of true competition in this vital area is to begin to lay the same groundwork that characterizes every other industry, and that is a groundwork for international competition.

The argument that the phone system is an integral part of our national defense, and therefore must be domestically based, is absurd. It's not like a foreign competitor could simply pull the plug on an installed network to apply political pressure. The European PTTs and Japan's NTT would be happy for a shot at accounts the size of Citicorp's, and AT&T, today a far more aggressive marketing machine than in the old days, would no doubt like doing business in countries whose economies are still growing.

Eventually, the artificial barriers will fall. There's no time like the present to aggressively explore the means to bring this about.



## LETTERS TO THE EDITOR

## Avast, ye swabs! Piracy outlooks differ

Your article "The upside of software piracy" [CW, July 2] neglected a very salient point — namely, that piracy allows users to evaluate a product before spending their money on it. The "sealed-disk" warranty does not allow an examination of a product, and a 30-day return policy is not sufficient.

Most software products require many hours of concentration (difficult to achieve under ordinary working conditions) to totally evaluate. In many cases, a software package is unsuitable, not because it does not do the job as advertised and not because it has fatal bugs or flaws, but because it does not do the job in the manner that the user wants it to be done.

I have between \$500 and \$1,000 worth of software that I have purchased, tried and then abandoned because I felt that it was either not suited for my needs or had a fatal flaw. It is particularly significant when you consider the fact that a similar amount was spent on replacements.

I frankly do not like the idea of using pirated software; all of my "working" software packages were purchased. However, I feel that "borrowing" a copy of a package for evaluation is a natural outcome of being "burned" once too often by unsuitable, if not totally unusable, software.

C. O. Fredregill Jr.  
Houston

Jay Zagorsky has taken supply-side economics to a new extreme in "The upside of software piracy" [CW, July 2]. According to Zagorsky, software publishers are supposed to provide the supply and not complain when it is

pirated on the side. Somehow, Zagorsky has concluded that the software industry should embrace piracy because it promotes future sales.

Wrong. Software piracy is theft, pure and simple. It's not a question of economics but rather one of ethics. Copying Version 1.0 of Product X doesn't give you an economic incentive to legitimately acquire Version 2.0, any more than stealing this year's Honda Accord LX gives you an economic incentive to buy next year's Honda Accord LXI. If anything, software piracy suggests to the user that if he or she didn't buy Version 1.0, he or she needn't buy Version 2.0 or, for that matter, any commercial software.

Zagorsky fails to mention that users of pirated programs do not receive documentation, technical support or legal upgrades. The ultimate victims of software piracy are users who rely on original, virus-free software products and full-scale services.

The newly merged Software Publishers Association and Business Software Alliance are committed to fighting software piracy. This will foster a free-market environment in which software publishers are encouraged to continue supplying the demand for reliable software solutions with creative products and full services that truly meet users' needs.

Ken Wasch  
Executive Director  
Software Publishers  
Association

Tom Lemberg  
Chairman  
Business Software Alliance  
Washington, D.C.

## The waiting game

Imagine that a General Motors division develops a car that looks and rides like a Cadillac, gets far better mileage and performs like a sports car. Further, imagine that GM resists marketing the car because it might hurt Cadillac sales.

It seems this is what Microsoft is doing with OS/2. In their feverish attempt to protect Windows, Microsoft is losing sight of some important facts of life. Windows provides an excellent shell for DOS and will enjoy a huge personal computing market. Under the glitz, it's still DOS, which is fine for most PC users.

The corporate computing market is a lot different. DOS was a "make-do" solution at best. OS/2, on the other hand, is a real operating environment platform for business systems. Microsoft should not resist IBM's optimized, tuned and markedly smaller version of 1.2.

The corporate world will be requiring distributed systems and have little use for terminals. Thus, it shouldn't be forced into a "make-do" operating system because Microsoft can't do product differentiation. This raises serious questions about the OS/2 Version 2 holdup. Are we waiting until it can run Solitaire?

Walt Corey  
Senior Systems Engineer  
North Scituate, R.I.

Computerworld welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor In Chief, Computerworld, P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax: (508) 875-8931; MCI Mail: COMPUTERWORLD.

# High technology's peace train

RICHARD GEPHARDT



The exciting advanced technologies provided by the computing services industry have helped to break down once almost inviolable barriers between nations. Modern communications and computing technologies were not the sole reason for the recent revolutions in Eastern Europe, but they played an important part.

Modern communication such as computer-to-computer, facsimile, satellite and other media helped bring the truth about Western life to people who were previously blinded by the restrictions of national censorship.

These same technologies have created the potential for tremendous increases in trade between nations. That is of obvious importance to the "bottom lines" of your enterprises and your industry. But it is also of importance to all of us in its implications for world peace.

Logic and history teach us that peoples and nations isolated from each other far more frequently develop conflicting practices and ways of life than do those in constant touch through trade and commerce.

Gephardt is the U.S. House majority leader (D-Mo.). This piece is excerpted from a speech in June to the World Computing Services Industry Congress.

Despite this potential for significant increases in world trade, many serious barriers persist.

I have outlined an eight-point program that will help reduce those barriers for the computing services industry. It is not a "U.S. or American" program, contrived to benefit my nation or continent over any other. Rather, it is an international program, calculated to enhance the production and distribution of goods and services worldwide.

First, there must be a level playing field. All competitors must be on the same competitive footing. They must gain advantage only by skill, hard work and other real advantages, not by "stacking the deck" through contrived laws and practices.

Second, unfairly restrictive tariff barriers must be eliminated. In those few cases where legitimate reasons of national security or national interest predominate, they should be expressed openly and fully, with fair opportunity for negotiation.

Third, nontariff trade barriers must be eliminated. Such considerations as national security and individual privacy are often the justifications for restrictive trade practices that limit the transfer of technology to Eastern Bloc nations or prohibit the flow of information across national borders.

Fourth, we must work toward the development of uniform international standards for the protection of computer software

intellectual property rights. The software developers must have a fair opportunity to exploit their developments, to advance the developments of others and to assure reasonable compatibility and ease of use.

Every technologically advanced nation recognizes the importance of protecting the proprietary rights of those who create computer software. Yet the laws regarding copyright, patent and trade-secret protection of computer software are an international hodgepodge, standing in the way of software creation, distribution and use. We still have a long way to go before we have the necessary common international basis for the recognition of substantive computer software rights.

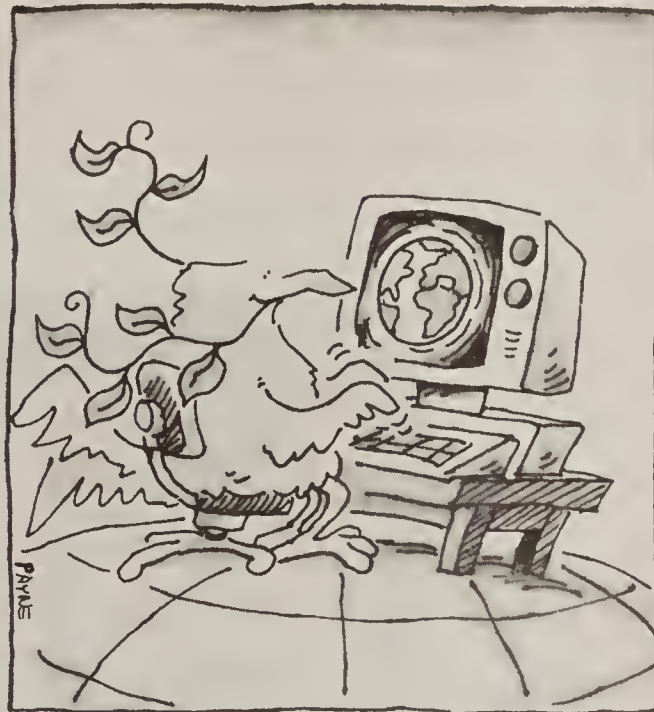
Fifth, we need effective national and international antipiracy enforcement. Whatever limited activity there is takes place by virtue of the work of private companies and trade associations and in the face of active governmental opposition.

Law enforcement organizations must recognize that enforcement of computer-related rights is just as important as enforcement of any other crimes

against property.

Sixth, we must encourage the development of international standards for communication between different computer systems, without impeding technological development.

Communications barriers will not finally yield until all major computing systems worldwide can interact, a goal far beyond our present reach.



Tom Payne

Seventh, we must develop international standards for the protection of individual privacy, for the security of computer systems and their data, for the performance of computer systems and for the protection of consumer interests.

The concerns of so many about a Big Brother data resource that will infringe civil liberties; the virus and worm prob-

lems that have threatened computer systems worldwide; and the growing complaints of inadequate performance and misrepresentation to the public are all examples of problems that will continue to block full exploitation of the technologies.

Eighth, we must improve the number and qualifications of persons who can design, make and use the computer systems of this decade and the next century. There is already a shortage of skilled computer talent in the U.S., and the projections for the future are frightening. A coordinated international educational effort is important if we are to realize the promise of the technology. I've called for many changes, beginning with a relaxation of restrictions on high-tech exports to Eastern Europe.

Today, we sell more high-tech equipment to the repressive communist regime in China than we sell to the new democ-

racies of Poland, Czechoslovakia and Hungary combined. Surely, the progress these brave nations have made in terms of economic and political reform would be enhanced by additional sales of such technology from our nation.

If we remain ever vigilant in our commitment to freedom and democracy, the new technologies will continue to advance those goals.

## IS needs to learn new rules to play innovation game

PETER OGNIBENE



There are certain incontrovertible rules in life: Don't walk down Fifth Avenue on Saint Patrick's Day wearing orange. Never play high-stakes poker with a man named Doc. And don't risk a promising idea on the information systems department.

As someone who makes his daily bread from a relatively new technology — smart cards — I have had that last rule driven home to me time and time again. I'm not sure why, but perhaps, like infant and mother, the techie bonds mystically to his mainframe for life. Whatever the force, woe to the individual, inside or outside the organization,

Ognibene is vice-president for corporate development at Applied Systems Institute, a Washington, D.C.-based firm specializing in smart card applications.

who would dare to step between the two with (gasps!) a new idea.

Automated source data. Decentralized processing. Distributed database. Oh, how MIS (Muzzlers of Innovative Solutions) loves those buzzwords. The problem comes when somebody gets serious about actually putting those concepts into practice. As soon as there's even a hint you might be serious about something new, the IS masters draw their CPUs into a circle and take aim.

**Speaking from experience** Consider a recent personal experience. I tried to convince the vice-president of marketing at a major hotel chain to consider the possible benefits of using smart cards to automate its frequent traveler program.

All the customer's data — credit-card accounts, frequent flier number, room preferences and even a listing of his or her sizes to facilitate gift buying — could be carried in the microchip

on a single smart card. Frequency points could be redeemed at the hotel — thus saving the chain the high administrative cost of sending out statements. The customer's card could carry an electronic key to the room. Check in and checkout could be done by a clerk, at a self-service kiosk or from a handheld unit in the hotel van taking travelers to or from the airport.

Finally, at the end of the stay, all those travel costs could be gathered electronically in the smart card's microchip and imported instantaneously into an electronic spreadsheet to simplify expense reporting for the business traveler.

After months of silence, the hotel marketer sent me a letter, raising my hopes, only to dash them when I got to the sentence: "While the issues described in your letters are intriguing to be sure, I must refer you to our vice-president of IS."

I knew better but seeing as my job description demands I regularly suffer rejection, I called and gave the VP my best shot. The response was not dissimilar from that of a toddler in his terrible twos: "No No No!"

At first I tried to counter his

reflexive negativity with reason, but it was no go. His tongue had switched to automatic pilot: "We looked at that and decided it wouldn't fit . . . We thought of that but decided it wouldn't work . . . What do we care after the business traveler has left the hotel; that's his problem."

When he made that last remark (in response to the system's expense reporting feature), I threw in the towel. Any hotel chain executive — even one in IS — who does not appreciate the importance of attracting and satisfying the frequent business guest is beyond redemption.

### Negative connotation

I encountered similar negativity at a major naval depot responsible for inventory worth \$6 billion. The senior engineer described to me an inefficient microfiche system for cataloging parts for every ship, plane and power unit in the Atlantic Fleet. It was taking a week or more just to verify that the right-hand widget listed on the invoice was, in fact, a right-hand widget.

At the engineer's invitation, I drafted a proposal describing how smart cards could identify a

part from delivery through repair and return to service, but instead of discussing the merits of the proposal I got a brief letter from his superior with this kiss-off: "After a review by management and technical personnel, we have concluded that this concept should be placed on 'hold' pending development of other basic applications." And on "hold" it has permanently remained.

More often than not, the IS department simply avoids innovation — unless, of course, the ideas originated in-house. Chief executive officers who find their IS departments infected by this deadly "not invented here" syndrome may well decide the only cure is to "outsource" their data processing to organizations that regularly incorporate a healthy dose of innovation.

To some extent, all of us are captives of our own experience. Although there are dynamic individuals in IS departments, I have encountered many who appear estranged from the firms that employ them. Then again, maybe I'm wrong. Maybe these companies really are in business just so the IS department can manufacture and manipulate data.

# BRING AN EXPERT INTO FOCUS.



## **INTRODUCING LEVEL5 FOR FOCUS. THE ONLY 4GL INTEGRATED WITH AN EXPERT SYSTEM.**

Now you can meet your company's ever-growing demands for better information with the only proven 4GL to integrate the power of expert systems technology. We call it LEVEL5 for FOCUS. You'll call it The Expert 4GL.

LEVEL5™ for FOCUS is a complete application-development environment that combines 4GL tools and data management with a fully optimized rule-based inferencing system. Now you can create a new generation of FOCUS applications that capture and apply knowledge. The rules and regulations, policies and procedures on which every company relies. You can turn simple decision support into advanced decision management.

FOCUS is proven technology for accessing, manipulating, and storing data. For the first time,

strategic knowledge can be consulted from any of these critical functions from any point in your application. And since you can do this from many applications, you can better address consistency and maintenance across your organization.

It's from Information Builders, so you can apply these unique capabilities to data in every file and database in your IBM or DEC data center including DB2, SQL/DS, IMS, Rdb, DBMS, and RMS.

Only Information Builders provides seamless integration between the most widely used 4GL and the fastest growing expert system to give you The Expert 4GL. Now give your applications the power to deliver the best information. Contact Information Builders, Inc., 1250 Broadway, New York, NY 10001, or call 212-736-4433 ext. 3700.

 **LEVEL5 for FOCUS** 

INFORMATION BUILDERS, INC., 1250 BROADWAY, NEW YORK, NY 10001

**212-736-4433 Ext. 3700**

## COMMENTARY

Rosemary Hamilton

### A hint of large systems



At the IBM large system briefing last month, James McGroddy, IBM's director of research,

dropped several hints about what these new mainframes will be based on.

The new mainframes have been described by IBM as a cluster of high-performance processors dedicated to specific operations. The idea is to replace the current general-purpose, do-everything host with a corporate nerve center. This would handle centralized tasks, such as network management or database management, while many traditional mainframe applications would be offloaded to smaller processors. To achieve this, IBM claims it will eventually deliver processors running at 500 million instructions per second (MIPS) and clusters that clock in at the thousands of MIPS range.

Some of the work for which McGroddy is currently responsible will likely show up in these future nerve centers. Although CMOS chip technology gets most of the industry attention today, McGroddy said that the key to mainframe progress continues to be the older bipolar technology. Despite recent advancements in CMOS chips, they are still about four times slower than bipolar, he said.

Expect System/370 micro-processor chip sets to play a roll, particularly to achieve parallel operations. McGroddy said

*Continued on page 30*

## Index, partner unveil CASE tool

*Deloitte & Touche inaugurate Index partnership with life-cycle CASE family*

BY ROSEMARY HAMILTON  
CW STAFF

For Index Technology Corp., IBM is apparently not the only big business partner in town.

Index last week introduced a full life-cycle computer-aided software engineering (CASE) family of tools in conjunction with Deloitte & Touche.

Company executives said this is the start of a long-term deal between the two companies, from which several other products will result. The first product, 4Front, includes a project management component in addition to the standard CASE tools, including tools for planning, design and analysis. The companies also plan to address the re-engineering phase of CASE with a

product to be announced later this year.

In addition, Index executives said they will soon announce a code generator. Currently, the 4Front product provides links to Microfocus' Cobol code generator and IBM's Cross System Product.

While several companies have recently promoted their full life-cycle products as IBM AD/Cycle alternatives, Index is positioning 4Front more as an extension of the AD/Cycle concept. While it will likely compete with IBM or other AD/Cycle business partners on a component basis, it will eventually tie into the IBM Repository.

Index is one of the IBM inner-circle business partners for AD/Cycle. Index not only has a mar-

keting arrangement with IBM, but it has also worked on the development of AD/Cycle. Its latest arrangement with Deloitte & Touche does not present a conflict with the IBM relationship because IBM's plan is for many different products to tie into AD/Cycle, Index officials said. The goal is to eventually provide AD/Cycle compatibility for the 4Front product.

"AD/Cycle recommends no one methodology," said Vaughan Merlyn, chairman of CASE Research Corp. "In some respects, these are two very different situations. It's compatible with AD/Cycle and not in conflict."

The companies will initially offer 4Front based on information engineering methodology.

Index has long promoted the flexibility of its tools, such as Excelerator, and claimed that they can be easily customized to a variety of methodologies.

### Other methodologies

Index hopes to accommodate other methodologies because different phases of the life cycle are suited to various approaches, said Mike Deverell, a partner at Deloitte & Touche. The re-engineering product will support a different methodology than information engineering, which is more geared for up-front design, he said.

The advantage of having a flexible approach rather than committing to one methodology is that flexible tools are more likely to fit into a customer's existing environment, Merlyn said. The downside is that the tools tend not to be as highly integrated and automated as a set of tools built with one methodology in mind, he added.

## Commercial shops exposed to MUMPS

### ANALYSIS

BY MAURA J. HARRINGTON  
CW STAFF

As though it were actually the disease, MUMPS, the Massachusetts General Hospital Utility Multi-Programming System, has been avoided by most markets outside the health care industry in the U.S.

However, after two decades with a relatively low profile, users and vendors agreed that MUMPS may be gaining use in commercial information systems shops, which is partially because of IBM's and Digital Equipment Corp.'s efforts and their strongest marketing support to date,

vendors claimed.

Last May, IBM announced full support for its MUMPS operating system, and DEC upgraded its MUMPS software implementation in June.

MUMPS is a multipurpose, multiuser, interpreted or compiled high-level programming language, formally accepted by both the American National Standards Institute and the Institute for Computer Science and Technology as a Federal Information Processing Standard, according to a spokeswoman for the MUMPS User Group.

MUMPS was designed by Octo Barnett at Massachusetts General Hospital in 1966. Barnett, then director of the infor-

## It's spreading

While MUMPS is still somewhat of a niche market product, its user base is expanding into other markets, said IBM, which recently announced new support for MUMPS. Richard Wingo, manager of MUMPS marketing at IBM, said MUMPS products from IBM are being used across several industries including shipping, health care, banking and more.

"We upgraded our support for MUMPS to be treated like all of our other products in the end of May [1990] because it is a strategic product for us now," Wingo said, adding that he has sold the product to several different businesses, including a prison in Canada, a credit union, a trust company and in the banking industry, in addition to the health care industry.

However, Wingo agreed that the language is still not completely accepted in the commercial market sector.

MAURA J. HARRINGTON

mation systems department at the hospital, developed MUMPS as a means to make an easy-to-use, hospitalwide information system that would combine all of

the best features of other languages, he said.

MUMPS — half language, half built-in database — is

*Continued on page 31*

## NAPERSOFT

NAPERSOFT, Inc.  
One Energy Center  
Naperville, IL 60563-8466  
708/420-1515

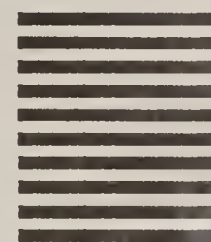
### Treats Customers Write

NAPERSOFT® Automated Correspondence Software handles your written communications to customers quickly, accurately and professionally with:

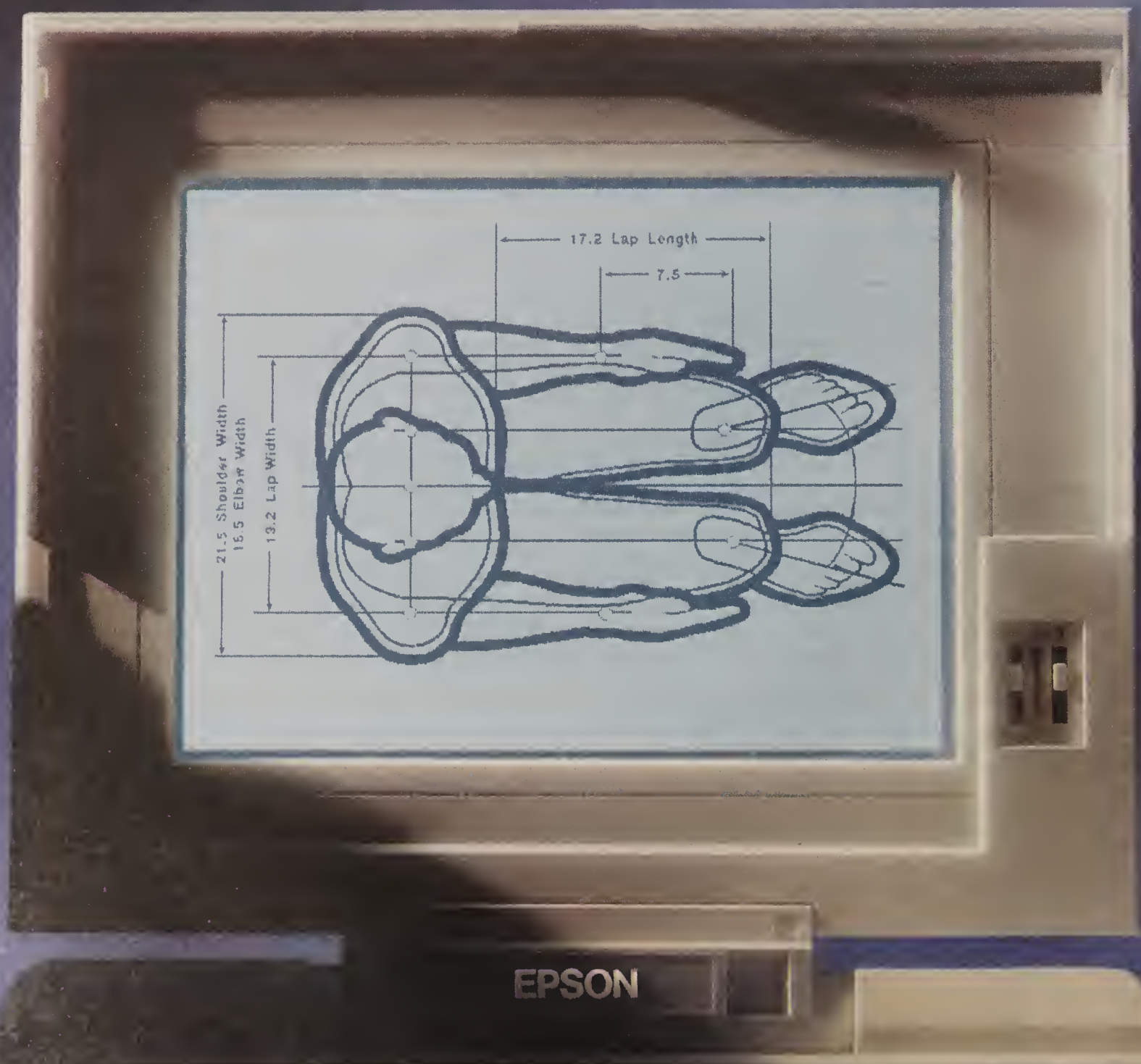
- On-line or batch letter writing
- On-line notepads
- Spell checker
- On-line letter history
- Full function word processor
- Full printer support

With your IBM mainframe and NAPERSOFT software you can streamline your customers correspondence! NAPERSOFT... for businesses that treat customers write.

FIRST  
CLASS  
SERVICE



A laptop designed  
that while your  
your lap will stay p



\*Third party drive port available from Manzana Microsystems, Inc. Epson is a registered trademark of Seiko Epson Corporation. ©1990 Epson America, Inc., 2780 Lomita Blvd., Torrance, CA 90505. (800) 922-8911.

with the knowledge  
needs may expand,  
pretty much the same.

---

#### Introducing the Equity LT 386SX Laptop

---

Adding power, speed and peripherals to a personal computer is a constant test of design innovation.

Configuring a *laptop* to meet expanding needs becomes an even more demanding challenge because size, weight, and battery life come dramatically into play.

Epson® engineers have met that challenge with their new Equity LT 386SX, featuring one of the most powerful microprocessors available in a battery-powered laptop. It is a design of both distinctiveness and common sense.

Epson's Datasafe hard drive can be removed, making it easy to transport, or store separately for added security. With an optional\* drive port, the hard drive can plug directly into a desktop computer. It offers a choice of 20 MB or 40 MB



Epson's unique, removable  
hard drive: key component of the  
most flexible laptop ever made.

capacity, and a shock indicator that alerts the user to the occasional hard knock.

The modular design of Epson's entire laptop series suggests a new standard for customized performance. The user can easily install or remove options such as a modem, extended RAM, external keyboard, or 2/3 length industry standard card. The VGA screen can also be removed or left in place when using an external monitor.


The Epson laptop indicates its own vital signs—battery life, speed, and disk drive in use—on a unique LCD status bar, and even has the good sense to turn off its own screen and hard drive when not in use.

The LT 386SX offers a degree of speed, power and flexibility once limited to desktop computers. In fact, there is one feature of this remarkably engineered bit of technology that a desktop can only envy. Its size.

Engineered For The Way You Work.<sup>SM</sup>

**EPSON**

# You'll choose our financial software for its technology, but you'll keep it for its fit.



In evaluating financial software for your company, consider this: the technology you buy today is only as good as its ability to furnish your needs tomorrow. Which is why so many corporate leaders have chosen SAA-compliant DB2 applications from Walker Interactive Systems.

In fact, only Walker has the technology to give your company a functionality fit from the start. That's because our unique architecture lets you completely personalize your Walker applications for your business. And no matter how much, how often, or how quickly things change, Walker will keep you operating comfortably.

Just ask any of our clients. While they've grown and prospered, we've become stronger, more focused, and uncommonly consistent.

So give Walker a call, and find out how a good fit today can put your company in a lot more comfortable position tomorrow. Call (415) 495-8811 for more information.



Walker Interactive Systems™

# The birth of a new benchmark

*Benefits may be swift for vendors, but users should not expect much yet*

BY JEAN S. BOZMAN  
CW STAFF

SAN FRANCISCO — A new benchmarking test for the database industry is about to be born: the Transaction Processing Council's TPC/B benchmark is intended to provide the "level playing field" that would help users sort databases by relative performance.

However, the immediate benefits may be reaped by vendors rather than users, and the results may still have to be taken with a grain of salt.

The specification is in the final approval stage, said Peter Friedenbach, a Hewlett-Packard Co. database management system (DBMS) product manager and chairman of the TPC's executive steering committee. The 34 members of the 2-year-old council will either have to approve the specification or submit proposed changes to it. The council's first benchmark, TPC/A, was released in November and is already being used. However, only two vendors — HP and Digital Equipment Corp. — have submitted test results for public inspection. TPC/A measures full system throughput while TPC/B tests only the DBMS performance.

"We finally have something of a level playing field [with these benchmarks in place]," said Jon Davis, an HP 3000 product manager involved in the TPC/A testing. "Some vendors will publish their results because they be-

lieve their price/performance is very good, while other vendors would not be inclined to publish unfavorable results."

Still, users are skeptical about most benchmarks, including the ones from TPC. Many prefer to write their own, believing that they better reflect everyday work loads. "We don't trust benchmarks generally," said a database manager in the Pacific Northwest. "We are much more interested in knowing how a given system responds to what we

**USERS ARE SKEPTICAL about most benchmarks, including the ones from TPC.**

throw at it."

Praful Shah, marketing manager at Tandem Computers, Inc., agreed: "Most users want to see how their own workload runs on our machines. Benchmarks are more widely used in selling situations, when vendors are bidding against each other."

Other users accept vendor benchmarks — or even request them. "We look at [HP's] own benchmarks," said Ed Wiggins, manager of operations at Dreyer's Grand Ice Cream in Lafayette, Calif. "But we evaluate machine performance by using the Powerhouse package from Cognos [Inc.]. That way, we can

see how many CPU cycles were used by each batch application we run."

TPC/B is aimed at replacing a widely-used benchmark called TP1, which critics said was misused in vendor ads claiming high transaction rates for DBMS products. TPC/B works by "firing" transactions at the DBMS being tested, whether that DBMS is relational or not. Because it is aimed at software performance, TPC/B is expected to be more widely used than TPC/A — and less expensive to run.

The TPC/A test is considered to be both time-consuming and costly. For example, the TPC/A test of the HP 3000 Model 900 series took months to complete, HP managers said. "We attempted to make the TPC benchmarks very, very rigorous tests," said council member Tim Negris, group product manager of Sybase, Inc.'s SQL Server. "Users' confusion about benchmarks hurts us more than than someone making up their mind [to purchase] based on the TPC numbers."

If the TPC benchmarks are to become industry standards, users have to be brought into the process, Friedenbach said. However, there are some obstacles: Seats on the Council cost \$5,000 each, he said, and each member has to send delegates to six three-day meetings per year. "We've had a problem trying to make the user community aware that we exist," Friedenbach said.

# Open systems AWOL in military computing

BY J. A. SAVAGE  
CW STAFF

Open systems have not yet made it through basic training in the world of military computing, where the emphasis has been on compatibility with proprietary systems, a recent report indicated.

Most of the military mainframe purchases made in the last five years reflected a preference for compatibility with IBM, Unisys Corp. and Bull HN Information Systems, Inc. mainframes, according to a report by the General Accounting Office (GAO).

Only 15% of the 155 procurements during the last five years were made without compatibility being an issue, the report said.

While commercial business is moving toward open systems, the GAO saw no such trend toward more open systems or toward more compatible procurements for the Department of Defense.

Of the \$82 million spent on computers, the largest share — about \$24 million — was spent on IBM and IBM-compatible equipment.

Amdahl Corp. received the biggest percent increase in spending, going from about \$500,000 in 1986 and about the same in 1987 to nearly \$6 million in 1988.

During those same years, IBM showed the biggest dollar increase, from \$4 million to \$15 million.

The years since the start of 1986 brought in some military business for Storage Technology Corp., which racked in \$9.2 million — \$6.5 million of which was brought in during the first year. NCR Comten, Inc. reached a total of \$3.1 million in 1986 and \$1.3 million in the following years.

Control Data Corp. had enough business with the military to be mentioned by name but did not make it into the charts. It was only noted that the company gained "less than \$50,000" in contracts.

Sole source and single-offer contracts accounted for only a small percentage of the money spent on data processing, totaling \$2.7 million in the last three years. In competitive bids, the government spent \$10.4 million.

The cut of the budget going to developers or systems integrators grew in the last few years. In 1986, those contracts were only \$100,000, but in 1987, the amount grew to \$600,000. In 1988, it leaped to \$6 million. Last year's figures, however, were incomplete.

The GAO did not analyze the procurements; it only reported raw numbers for the House Committee on Government Operations.



# Image gets thumbs-up verdict from attorneys

ON SITE

BY SALLY CUSACK  
CW STAFF

BETHPAGE, N.Y. — Attorneys working for Grumman Corp.'s legal department spend more time planning strategies these days, thanks to an imaging system that drastically reduces the amount of time previously devoted to paper-intensive research and documentation procedures.

Using a Wang Laboratories, Inc. imaging-based system, firm lawyers and paralegals can now accomplish in a day what used to take weeks with traditional type-and-file office methods, said Arthur J. Kingfield, program director of information systems at Grumman Data Systems.

"We've increased productivity tenfold in the document retrieval area," Kingfield said, add-

ing that specialized searches that used to take days can now be completed in minutes. The firm still archives the paper documents as backup instruments, but the imaging system accommodates all of the legal department's routine procedural needs.

Imaging is a rapidly growing market, with system sales generating \$360 million in revenue for 1989, said Jane Stanhope, an industry analyst at BIS CAP International, Inc., a research and consulting firm in Norwell, Mass. Stanhope indicated that imaging system revenue is expected to hit \$2 billion by 1993. While no specific numbers are available, it is anticipated that the legal and medical professions will account for a fair percentage of these sales.

The system at Grumman has been in production for nine

months, and according to Kingfield, the employees are extremely satisfied with its performance. The installation was accomplished after an extensive, 12-month internal needs analysis. During this time, Kingfield and his staff worked closely with the legal department, analyzing the paper flow process and dissecting other contributing factors, such as outside-contractor labor procedures and individual litigation phases.



Kingfield and his staff discovered that a mind-boggling 100,000 to 500,000 pages of documentation are generated for each litigation procedure.

"We didn't come out of the gate with imaging in mind, but after witnessing file after file after file being accessed, processed, stored and reviewed, and accessed again — that's what

really made the decision," Kingfield said.

The department is using a Wang VS 7120 and a Wang optical jukebox. Sixteen Wang 280 personal computers are used as imaging terminals, and 15 Wang 4430 terminals are devoted to data processing and office automation applications. The system also incorporates Wang automatic sheet feeders and scanners and uses a fiber-optic network to handle image transfer functions.

Aside from some minor problems with the jukebox installation, Kingfield said, the installation process went quite smoothly. However, he indicated that it was software — not hardware — that drove the decision-making process.

"We were looking for an off-the-shelf solution, and we finally had it narrowed down to several applications," he recalled. The packages were brought to the legal staff for hands-on evaluation.

At the time, IBM's Image Plus was deemed too immature and too cumbersome to fit the department's needs. The staff

was already familiar with Wang's office and word processing packages, and the Wang Integrated Image System seemed to fit the bill for both application and integration purposes.

The company also wrote an in-house imaging tool, using a fourth-generation language database generator called the Litigation Tracking System, a package purchased from Minicomputer Interactive Systems of California. According to Kingfield, it provided a very flexible database function and was extremely useful in creating and testing pilot applications.

Referring to the overall transition, Kingfield said he feels that the "long pull" was getting the documents themselves abstracted and into the system — an extremely time-consuming task. Now that all is said and done, however, everyone seems happy, he said.

"The system is very popular with the attorneys, and we're getting a lot of great internal press," Kingfield said. "We've gained tremendous efficiency in the paper-shuffling process."

# What do you get with a supercomputer times 2?

Scientists hope to discover if two architectures are twice as effective at solving problems

## ON SITE

BY ELLIS BOOKER  
CW STAFF

PITTSBURGH — If you combine the qualities of a cheetah and a Ferrari, do you get a fabulously fast hybrid creature or an average-speed sports car with a taste for gazelle meat?

The Pittsburgh Supercomputer Center is attempting to merge two fast supercomputers — one with a massively parallel architecture, one without — that some might say were never intended to work as one.

The center recently acquired a 32,000-processor Connection Machine from Thinking Machines Corp. in Cambridge, Mass., that it hopes to run in combination with its 1½-year-old Y-MP supercomputer from Cray Research, Inc. in Minneapolis.

The two machines, already tethered over a relatively sluggish 10M byte/sec. Ethernet local-area network, will eventually be equipped with a high-performance parallel interface and will be linked over a 1G byte/sec. fiber-optic LAN.

"I don't have a religious preference for machines of one type or another," said Ralph Roskies, scientific co-director of the center. "The real goal is to allow peo-

ple to get their scientific work done."

It is clear that for different computational problems to run at top efficiency, different types of equipment are required, Roskies explained. He added, "The more interesting question is: Are there *pieces* of problems that run more effectively in different architectures?"

That is what the Pittsburgh center hopes to discover by the end of the year, when the Y-MP and Connection Machine will be connected over a 1G byte/sec. LAN from Ultra Network Technologies. The two supercomputers will then, hopefully, communicate at about 800M byte/sec.

### Code chopping

Getting the Y-MP and the Connection Machine to work together will involve more than a network cable between them. As with all parallel architectures, programming tasks for a Connection Machine involve "parallelizing" the computer code — chopping the code into relatively simple bits that both processors can attack independently.

This inherent complexity will be increased when the two supercomputers are operated in tandem. A new operating system will likely be needed to automate the job of deciding which parts of a computation should be handed to the Connection

Machine with its parallel architecture, and which parts are best left for the vector-processing Y-MP.

### Computing concern

Cray has hinted for some time about its interests in parallel computing.

However, Roskies said, "We weren't prepared to wait a couple of years [for a massively parallel system from Cray], so we looked elsewhere." Even so, Cray, which has always had an on-site staff at the Pittsburgh center, stands to benefit from the results of the center's experiment.

Roskies' ultimate goal is what he calls "a heterogeneous computing environment" — one that seamlessly integrates the best and fastest technology from a number of vendors.

Founded in 1986, the center is a joint project of Carnegie Mellon University, the University of Pittsburgh and Westinghouse Electric Corp. Purchase of the \$5 million Connection Machine was made possible by grants from the Defense Advanced Research Projects Agency and the National Science Foundation.

The Cray and Thinking Machines supercomputers will work on a host of projects, including gene sequencing, air pollution modeling and molecular dynamics computations used in drug design.

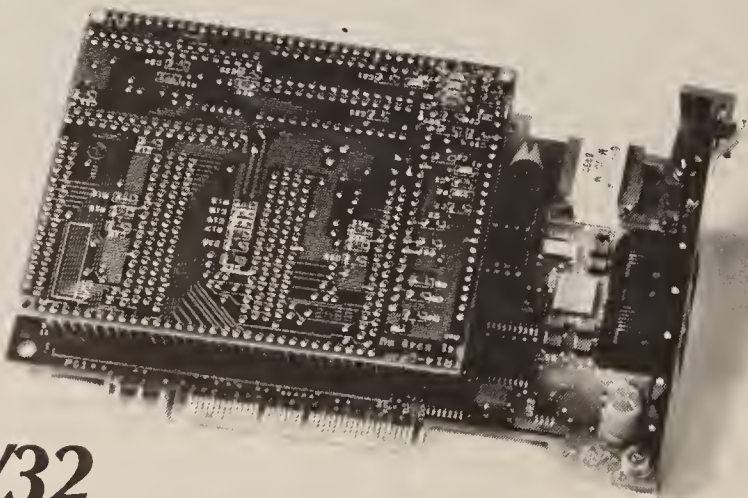
## SOFT NOTES

# JAM supports Ultrix/SQL

Jyacc, a New York-based software manufacturer of application development tools, announced that its Jyacc Application Management (JAM) tools product will now support Digital Equipment Corp.'s Ultrix/SQL, DEC's port of Ingres Corp.'s database management system Version 6.2. JAM was designed for developers to create front-end user interfaces to applications and data integration to SQL databases, a company spokeswoman said. The product, available now for \$4,275 per copy, also includes a data dictionary, Jyacc's proprietary fourth-generation language and a library of C subroutines, according to the company.

Raxco Software, Inc. said it will incorporate graphics capabilities into its Raxmanager Systemwide Resource Management System Version 3.0 this month, the company said. The graphics package, which the company acquired from Multiware, Inc. in Davis, Calif., includes line, bar, pie, scatter and stacked bar chart capabilities.

# SNA ENGINE



## SV32

### Integrated SDLC Adapter and CCITT V.32 Modem

Our SV32 integrated SDLC adapter and CCITT V.32 modem for IBM PS/2® with Micro Channel™ Architecture is a real SNA engine. Designed to power very high speed communications applications, the SV32 can run all of IBM's SNA connectivity software under DOS and OS/2® Extended Edition. And communicate with remote SNA hosts at speeds up to 12,000 bps over dial-up phone lines.

So to get your PS/2s equipped for real communications performance, install our SV32 SNA engine today and get ready for a fast ride. For more information, call toll-free 1-800-444-1982; in Texas or outside the USA call 512-345-7791.



MicroGate is a registered trademark of MicroGate Corporation. IBM PS/2, Micro Channel and OS/2 are trademarks of IBM Corporation.

## Hamilton

CONTINUED FROM PAGE 25

these processors are now used in the low-end Enterprise System/9370 but "will make their way to the mainframe line."

Mainframe DASD is being readied for huge capacity improvements. Currently, a disk on a high-end 3390 can hold 62 million bits of data per inch. In the lab, "we've shown in a real device that you can get above 1G byte per square inch," McGroddy said.

The 4M-bit memory chip is in use with the latest generation of 3090s. McGroddy said IBM has built and manufactured some 16M-bit chips, but they aren't running off the production line in any significant quantity. So, will the chip be used in the next-generation mainframe? "We haven't scored yet, but we're within the 10-yard line," he said.

Then what about the 64M-bit chip? "The 64M-bit chip is further down the field," McGroddy added.

To create these more dense and powerful chips, McGroddy said IBM is increasingly relying on X-ray lithography, which gives a more detailed look at the chips than current optical lithography. He said IBM has made "big investments" here, and he suggested X-ray lithography "could be a watershed. If you haven't invested in it, you could be left behind."

It's interesting that he suggested companies might be left behind. Some industry analysts said recently that IBM's overall large systems strategy is intended to create more distance between it and its competitors than exists today.

The new IBM systems will eventually include processors that will be optimized for specific operations. That could cre-

ate some big headaches for both the traditional mainframe competitors — Amdahl and Hitachi Data Systems — and those firms that have focused on specific operations, such as Teradata with database machines and Tandem Computers with on-line transaction processing.

"This really raises the ante, but IBM isn't doing it just because of them," said Rick Martin, an analyst at Prudential-Bache Securities.

Plug-compatible makers Amdahl and Hitachi could find it difficult to re-engineer the optimized processors and stay compatible, analysts said. Furthermore, they may not want to spend the money to provide such a variety of dedicated processors. IBM has tossed out several possibilities for dedicated processors in addition to database management and network management.

"They have to decide if the market is broad enough [for each specialized processor] to get into that business," Martin said. "Database, for instance, is broad enough. On the other hand, IBM also talked about an encryption processor. So [the competitors] may not decide to put their resources into that."

Companies that specialize in specific operations could get hurt if a customer eventually has a choice between snapping an IBM dedicated processor into the IBM large systems complex or buying one of their separate systems.

The competitors, however, are taking their usual stance on IBM's efforts — they've caught up with them before, they said, and they will again.

"We've done it eight times over the life of this company," according to an Amdahl spokesman.

Hamilton is *Computerworld's* senior editor, systems and software.

# MUMPS

CONTINUED FROM PAGE 25

known by its users as a comprehensible and easy-to-use language, with one of its best features being the way in which the language processes string command codes.

"[MUMPS] language syntax has all sorts of things built-in that lets the user manipulate the string data," said Timothy Wheeler, a systems analyst at the Analytical Information Management System at Chevron Research and Technology Co., the research arm of Chevron Industries, Inc.

Wheeler said the company uses Digital Equipment Corp.'s version of MUMPS to track more than 100,000 petroleum samples per year and manage the accounting for the company's 22 different analytical laboratories.

MUMPS' ability to manipulate the string data is important because it allows a user to write a given program more efficiently in MUMPS than in other languages, because the programmer can change any line of code without having to rewrite the entire program, Wheeler said.

Chevron Research has MUMPS installed on a DEC PDP-11/34 minicomputer, Wheeler said. However, the company is planning on porting its system to a Microvax 3600 in the near future, he added.

However, while MUMPS is gaining interest by users outside of the health care industry, it is still considered by analysts to be no more than a niche-market language for the health care environment industry.

Computer analysts deem MUMPS "a relic of the past" and "a floundering language" that had not been accepted by IBM until a few years ago.

A user group spokeswoman, however, claims that MUMPS is not a language designed for any one specific industry. She said while a \$100 million federal contract won by DEC in 1988 to install a MUMPS-based decentralized health care medical facility for the Veterans Administration's 31 largest locations throughout the country created a lot of publicity, the language has received a bad rap in the U.S.

"In Europe, MUMPS is more widely used across all industries," the group's spokeswoman said. "It's just in the U.S. where the stereotype exists."

While the user group has no statistics on how many or in which industries MUMPS has been used in the U.S., group Chairman and MUMPS consultant Richard Davis said there are presently about 1,350 members in the MUMPS User Group, including companies and individuals.

"We know there are lots of users writing in MUMPS out there, but there is no way to know exactly how many users there are because there aren't any analysts who follow MUMPS closely. Also, we can't seem to get the information from the vendors because to them, it's proprietary information," Davis said.

"People are reluctant to tell you they program in MUMPS. I think it's because they like to think with the mainstream," which has not included MUMPS in the past, said Richard Wingo, manager of MUMPS marketing at IBM.

Wheeler, a MUMPS user himself, agreed. "When I tell people I program in MUMPS they laugh at me... it is kind of embarrassing," he said, "but I don't care."

# Tandem plans revamp for commercial Unix

BY J. A. SAVAGE  
CW STAFF

Attempting to place its Unix fault-tolerant machine beyond the telecommunications industry, Tandem Computers, Inc. recently began making calls on commercial accounts six months after the computer began shipping.

The company — which "was dragged kicking and screaming" into open standards with its Integrity S2, according to Rikki Kirzner, an analyst at Dataquest, Inc. — appears surprised at the commercial opportunity for its machines.

"There is a tremendous amount of cu-

riosity on the part of MIS managers in immature [commercial] Unix markets," said Shirley Henry, Tandem's director of Unix product marketing. "They are taking an evaluation-intensive approach to Unix."

"Many of these people are people we've done business with in the past [with the company's proprietary operating system on-line transaction-processing computers]," said Bruce Dougherty, Tandem's director of Unix marketing.

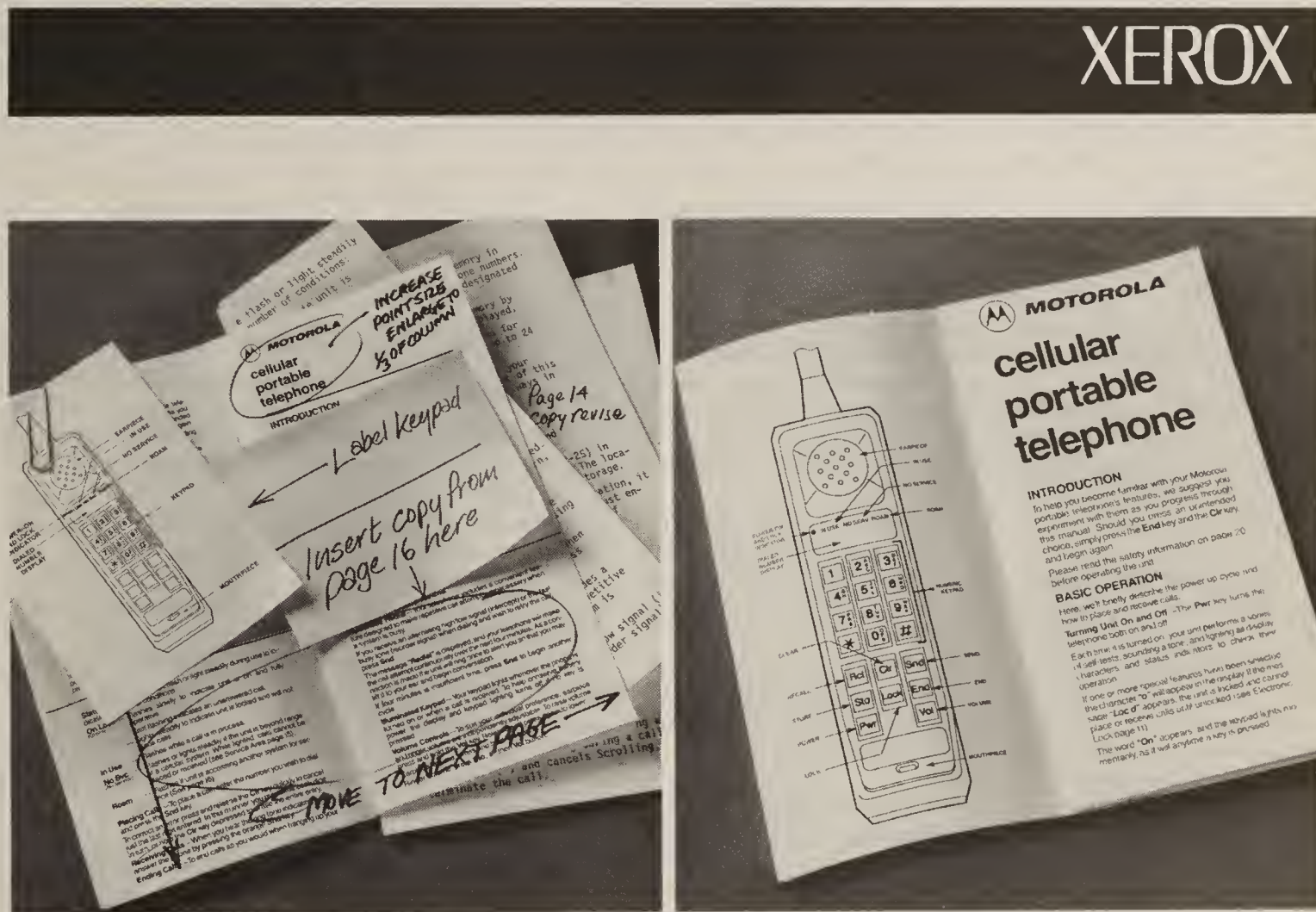
Tandem has sold about 150 Integrity systems, according to John Jones, an analyst at Montgomery Securities in San Francisco.

Of those, the company has sold at least

one into the commercial market, according to Dougherty, who would not elaborate further on the sale. The rest have been to phone companies for fault-tolerant switching systems.

If the company does not do well in commercial systems, it still has a future in telecommunications, according to Nili Young, vice-president of midrange system strategies with the Meta Group. She said that AT&T "3B" computers will eventually be replaced throughout the network with Tandem's Integritys.

"The commercial applications just aren't out there yet for Integrity," she said.



## Motorola wrote the book on cellular phones. A Xerox system lets them rewrite it in minutes.

Motorola is the world's largest producer of cellular phones. Not to mention cellular phone manuals. For which they turn to a company called Rich Graphics.

But when Motorola decided they wanted to be able to revise and reprint their manuals on a "just-in-time" production schedule, Rich Graphics turned to Xerox.

Working with Rich Graphics, Xerox developed a solution that integrated both hardware and software, Xerox products and other suppliers' products. And the resulting phone manual production is something to talk about—to say the least.

The manuals are now printed on Xerox laser printers just minutes after the revisions flash across the screen of a

Xerox workstation. Turnaround time is 80% faster. Costs are down 50%. And the documents produced are 99.99966% perfect.

Of course, Motorola isn't the only client that Rich Graphics uses Xerox for. And the resulting improvement in customer satisfaction has helped Rich Graphics double their printing business every year since they came to Xerox.

Which just goes to show that a partnership with Xerox can also help a company rewrite its bottom line.

If you have a document processing problem you'd like Xerox to help you solve, call 1-800-TEAM-XXR, Ext. 125A. Or send in the coupon.

Yes, I'd like to learn more about Xerox and how they can help solve document processing problems.

☐ Please send me information.

☐ Please have a sales representative contact me.



Send this coupon to: Xerox Corporation, P.O. Box 24, Rochester, NY 14692

NAME	Please Print	TITLE
COMPANY	PHONE	
ADDRESS		
CITY	STATE	ZIP 0013-8/6-90

© 1990 XEROX CORPORATION XEROX® is a trademark of XEROX CORPORATION

**XEROX**  
The Document Company

## NEW PRODUCTS — HARDWARE

## Data storage

Model 2300 Winchester disk drives have been added to Distributed Logic Corp.'s RDA series of 8-in. SMD/SMD-E storage subsystems designed for Digital Equipment Corp. VAX systems.

The drives offer a formatted capacity of 1.7G bytes per port and are plug-compatible with DEC's KDA50, KDB50, UDA50 and HSC50/70 controllers, the vendor said. The RDA series is also being offered with Model 1130 drives, which provide a formatted capacity of 848M bytes and a 15-msec. average seek time.

An RDA subsystem with a single Model 2330 drive sells for \$16,595.

**Distributed Logic**  
1555 S. Sinclair St.  
Anaheim, Calif. 92806  
(714) 937-5700

## Power supplies

Exide Electronics has announced a generation of uninterruptible power supplies designed for IBM's Application System/400 and Digital Equipment Corp.'s Microvax systems.

The Powerware Plus 5 series includes Models 3 and 5, both of which offer continuous on-line operation to protect single and multiuser microprocessor-based systems from input line surges, sags, brownouts and blackouts. The devices feature power ratings from 3 to 6 KVA and frequency input variations of 45Hz to 65Hz.

List pricing begins at \$4,730

for the Model 3 and \$6,695 for Model 5.

**Exide**  
3201 Spring Forest Road  
Raleigh, N.C. 27604  
(919) 872-3020



**Sola's MPC series for medical applications**

A line of 60Hz medical power conditioners has been introduced by Sola Electric.

The MPC series provides a regulated, quiet power source that protects medical equipment such as imaging systems, monitors, diagnostics and patient care equipment from electrical surges, sags, spikes and brownouts.

The series features automatic overload protection and operates at 120 dB in common mode and 60 dB in normal mode, the vendor said.

The MPC series sells for \$353 for 250-VA models, \$489 for 500-VA models and \$721 for 1000-VA models.

**Sola**  
1717 Busse Road  
Elk Grove Village, Ill.  
60007  
(312) 439-2800

## I/O devices

QMS, Inc. has announced a non-impact printer designed for barcode and label applications in retail and industrial environments.

The QMS Magnum CF 2215 features a 15-in. wide web print area, a flat paper path for forms handling, 15.6 ft/min. print speed and 240 dot/in. print resolution.

The printer was designed primarily for use with IBM Application System/400, System/34, 36, 38, IBM mainframes and 370 hosts.

The QS Magnum CF 2215 is available 90 days

after receipt of order for approximately \$60,000.

**QMS**  
P.O. Box 81250  
One Magnum Pass  
Mobile, Ala. 36689  
(205) 633-4300

Interface Systems, Inc. has announced a plug-compatible dot matrix printer designed to print bar codes and oversized labeling characters via IBM's Graphical Data Display Manager software at a rate of 400 char./sec.

Model 7224-202 supports IBM's Intelligent Printer Data Stream page description language and features an 18-wire print head that provides resolution of 144 by 144 dot/in. The printer connects to IBM 3174, 3274 or 3276 controllers via a coaxial port. It includes an RS-232/422 serial port for simultaneous connections to IBM Personal Computers, Personal System/2s or compatibles.

Pricing begins at \$4,950.  
**Interface Systems**  
5855 Interface Drive  
Ann Arbor, Mich. 48103  
(313) 769-5900

Ideal Technologies has introduced a customized version of Texas Instruments, Inc.'s 820 Keyboard Send Receive Data Terminal that is equipped with Digital Equipment Corp.'s Model LA120 emulation.

The 820 KSR serves as an interactive telecommunications terminal, as a remote I/O unit in DEC Timeshare environments or as a send/receive device in other data entry/retrieval applications.

The product's features include a preprogrammed self-test diagnostics capability to verify that power is on and maintenance diagnostics such as unit memory status.

The product costs \$2,165.  
**Ideal**  
13101 Washington Blvd.  
Los Angeles, Calif. 90066  
(213) 827-9023

## NEW PRODUCTS — SOFTWARE

## System software

Accelr8 Technology Corp. has announced a suite of Digital Equipment Corp. VMS transparency software for Data General Corp.'s Aviiion computers.

The products include Libr8, a library that provides the functionality of the VMR Run-Time Library and System Service calls on Unix systems; Transl8, a utility for moving text and binary files between VMS and Unix; DLC8, a command interpreter to process VMS command procedures on Unix; and EDT8, an editor that provides emulation of DEC's VMS EDT editor on Unix systems.

Site license prices start at \$11,888 for DCL8 and EDT8, \$49,888 for Libr8 and \$29,888 for Transl8.

**Accelr8 Technology**  
303 E. 17th Ave.  
Denver, Colo. 80203  
(303) 863-8088

Silden Software has announced two performance software packages designed for IBM System/36 machines.

The first product, 36/Life, provides users with performance software, toll-free support, a technical manual called "Extending the Life of Your System/36" and a newsletter that highlights System/36 performance tuning.

The second product, 36/Life Support, was designed to deliver three levels of performance tuning support.

A one-time license fee that includes unlimited use of support lines and a newsletter subscrip-

tion costs \$1,275.

**Silden Software**  
P.O. Box 35282  
Los Angeles, Calif. 90035  
(818) 716-1117

UIS has announced an enhanced version of V-X Manager, its Digital Equipment Corp. VMS operations management and reporting tool.

Version 2.0 includes a privilege control security mechanism that enables system managers to allow access to system management functions and site-written DCL procedures without granting VMS privileges to users. A reporting component that features graphics capabilities is also included.

The product is priced at \$2,650 for DEC's Microvax systems and \$21,000 for VAX 9000 machines.

**UIS**  
420 Bedford St.  
Lexington, Mass. 02173  
(617) 861-6262

## Database management systems

BMC Software, Inc. has released Version 2.0 of its Pointer Checker Plus software package.

The product validates pointers with a hash checking technique, which runs during an image copy process, and a full checking technique. Both features generate complete, concise reports on a database, the vendor said.

Version 2.0 includes a Database Zip Utility for displaying, altering and verifying prefix and

*Continued on page 34*

# Let CICS Manage Itself

## Automate Your CICS Regions with AOE

- Start, stop and recover CICS regions.
- Time initiate transactions, batch job support and CEMT commands.
- Monitor and correct terminal status.
- Trigger journal jobs on demand.
- Ship early problem warnings to consoles, TS0ids and to the HELP desk.
- Respond to CICS's WTOs, WTORs, abends and log messages with MVS activities, predefined WTOR responses and corrective CEMT commands.

The CICS Automated Operations Extension Facility is a proven approach to system managed CICS resources. Call us today for more information or a trial for AOE



Netec International, Inc.  
P.O. Box 180549 • Dallas, TX 75218  
Telephone (214) 343-9744  
FAX (214) 343-9009 • TLX 314419

NOT TO BE MISSED!

## IF YOU DEPEND ON CICS...

Attend a **FREE** introductory seminar  
for CICS/ESA Version 3!!!

**AUGUST 13, 1990**  
**10:00 a.m. - 4:00 p.m.**  
**OMNI PARK CENTRAL HOTEL**  
**Seventh Avenue at 56th Street**

Circle Education, the world-leading specialist in CICS education and consulting, invites technical support managers and systems programmers with CICS experience to attend a **FREE** one day seminar which will examine the new structure and functions of CICS/ESA Version 3, IBM's revolutionary platform for teleprocessing for the 1990's. Refreshment breaks and lunch will be provided.

Please call for more information concerning Circle Education's full schedule of CICS training seminars, and on-site training and consulting.

**CALL TODAY  
FOR RESERVATION!**

**Circle Education**  
**212-529-7589**

# Computer networking that's simpler than ever.

## OS/2 can do!

Seamless connectivity. Every business wants it. And every business will experience the limitations of trying to achieve it with DOS. But OS/2® Extended Edition (EE) was designed for connectivity and provides the flexibility you need today and tomorrow.

Now, you may only want to share a laser printer on a LAN configured with Token-Ring or PC Network. With OS/2 and OS/2

LAN Server, it's simple. Later, when you need to do more, like access a host or an Ethernet® network, you can, since OS/2 EE has these functions built in. And by adding IBM TCP/IP software, you can even access multivendor networks from your computer.

But best of all, when you combine OS/2 EE with IBM's Micro Channel™ and its interrupt-handling capability, you can run several communications sessions at

once—without sacrificing reliability, even during peakload conditions.

Want to simplify your computer networking? With OS/2 Extended Edition, the solution is IBM.

Find out more about OS/2. Contact your IBM Authorized Dealer or marketing representative. For a dealer near you, call 1 800 IBM-2468, ext. 197.



The IBM logo, consisting of the letters "IBM" in a stylized, blue, eight-striped font.



Continued from page 32

data segments of a database.

A perpetual license for Pointer Checker Plus ranges from \$12,000 to \$46,000, depending on CPU size.

**BMC**

P.O. Box 2002

Sugar Land, Texas 77487

(800) 841-2031

The Dylakor division of Sterling Software, Inc. has announced an upgraded version of its DYL-280-II relational software package, which was designed to manage data residing in Teradata Corp.'s DBC/1012 database machines.

The new version supports the full range of Teradata's ANSI-standard SQL syntax. It also enables data from one

source to be mixed with data from another source, the vendor said.

The product runs on any IBM MVS operating system and is available for \$23,760 to \$38,700, depending on group processor size.

**Dylakor**

P.O. Box 2210

9340 Owensmouth Ave.

Chatsworth, Calif. 91313

(818) 718-8877

Cincom Systems, Inc. has added a Query/Report-Writer option to its Comprehensive Planning and Control System (CPCS), which is a guidance tool for information systems.

The Query/Report-Writer allows IS executives and project managers to ac-

cess data on the CPCS and import, export, add, modify or read the information. The option enables users to build and execute procedures on-line and execute them in batch mode the vendor said.

Pricing for the CPCS with Query/Report-Writer ranges from \$3,100 to \$14,990, depending on software and hardware configuration.

**Cincom**

2300 Montana Ave.

Cincinnati, Ohio 45211

(513) 662-2300

Servio Corp. has announced Version 2.0 of Gemstone, its commercial object database management system.

Version 2.0 can run in a heterogeneous distributed environment and can

reportedly be configured with client and servers running on the same systems, depending on application. It runs on Sun Microsystems, Inc. workstations and Digital Equipment Corp. VAX/VMS machines and Decstations. The product is scheduled to ship in October, and a version for the RISC System/6000 is slated for a fourth-quarter release.

Pricing starts at \$12,000 for a four-user license.

**Servio**

1420 Harbor Bay Pkwy.

Alameda, Calif. 94501

(415) 748-6200

## Software applications packages

Dynax Resources, Inc. has announced an interactive, menu-driven system designed for textile converter applications prepared on IBM Application System/400 hardware.

The Textile Distribution Software package enables users to manage all aspects of converting — from greige goods processing and finishing to customer service, sales, order entry, warehousing, shipping and billing. It includes an inventory control module and features the ability to convert invoices prepared in foreign currency to U.S. dollars, the vendor said.

Pricing ranges from \$50,000 to \$75,000, depending on system size.

**Dynax**

2 Jericho Plaza

Jericho, N.Y. 11753

(516) 932-9080

Russell Information Sciences, Inc. has announced the release of Calendar Manager Version 3.4.

The enhanced software package enables users to arrange meetings and multiple standby meetings for simultaneous time slots. Video or telephone conferences can reportedly be scheduled with automatic worldwide time-zone adjustments. The package includes a link to Digital Equipment Corp.'s Vaxmail in all its print windows, and Decnet users can use the product without a need for a separate interface, the vendor said.

Version 3.4 is available in DEC VMS stand-alone, All-In-1 and X-O integrated versions. Pricing ranges from \$795 to \$34,995, depending on CPU size.

**Russell Information**

25201 Paseo De Alicia

Laguna Hills, Calif. 92653

(714) 768-5000

## Software utilities

Compuserve Data Technologies has announced the addition of Computer Associates International, Inc.'s menu-driven CA-Tellgraf and Access Technology, Inc. 20/20 interfaces to its Digital Equipment Corp. VAX/VMS-based System 1032 fourth-generation relational database management system.

The interfaces enable users of System 1032 to access data and transfer it to CA-Tellgraf for graphing or 20/20 for spreadsheet analysis. The System 1032/CA-Tellgraf interface is now available. The System 1032 20/20 began beta testing last month. Prices range from \$500 for Vaxstation configurations to \$15,000 for a VAX 9000 series license.

**Compuserve**

1000 Massachusetts Ave.

Cambridge, Mass. 02138

(617) 661-9440

# DB2<sup>™</sup>

## PRODUCTIVITY PERFORMANCE

### ...PARITY<sup>™</sup> DBSS

#### Within The Edit Session:

#### Functions

- Builds, tunes, tests and times SQL
- Provides an interactive tuning guide
- Hosts a complete on-line tutorial
- Standardizes SQL
- Delivers a comprehensive plan analysis

#### Features

- Contains an Artificial Intelligence System, providing extensive SQL performance analysis
- Supports all languages, QMF and SPUFI
- Analyzes and tests SQL from code generators and 4GLs
- Operates as primary ISPF commands



#### Benefits

- Cuts development costs by 20% or more
- Tunes, tests and times SQL before the first pre-compile
- Minimizes programmer demands on DBAs' time
- Reduces CPU cost
- Requires no special education
- Promotes programmer awareness of efficient SQL

Try PARITY on a 60 day free trial basis.  
Call today to arrange an on-site demonstration.

**Paragon Software International**  
One North Plaza  
P.O. Box 345  
Bogota, N.J. 07603  
(201) 641-3203 • 1-800-462-5582

**PARITY<sup>™</sup>**  
DBSS

THE  
DEVELOPMENT  
PARTNER ....  
for DB2



© 1990 Paragon Software International

# WHO'S ON FIRST?

You are with your own copy of COMPUTERWORLD. Subscribe now and receive 51 weekly issues for just \$38.95\* — a savings of 62% off the single copy price.

Address Shown: ☐ Home ☐ Business

First Name	MI	Last Name
Title		Company
Address		
City	State	Zip

Please answer questions to qualify for this rate.

1. BUSINESS/INDUSTRY (Circle one)
- 10. Manufacturer (other than computer)
  - 20. Finance/Insurance/Real Estate
  - 30. Medicine/Law/Education
  - 40. Wholesale/Retail/Trade
  - 50. Business Service (except DP)
  - 60. Government - State/Federal/Local
  - 65. Communications Systems/Public Utilities/Transportation
  - 70. Mining/Construction/Petroleum/Refining/Agric.
  - 80. Manufacturer of Computers, Computer-Related Systems or Peripherals
  - 85. System Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
  - 90. Computer/Peripheral Dealer/Distr./Retailer
  - 95. User/Other \_\_\_\_\_
  - 95. Vendor/Other \_\_\_\_\_
- (Please specify)

2. TITLE/FUNCTION (Circle one)
- IS/MIS/DP MANAGEMENT
- 19. Chief Information Officer/Vice President/Asst. VP
  - 21. Dir./Mgr. MIS Services, Information Center
  - 22. Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm. Network Sys. Mgt.; Dir./Mgr. PC Resources
  - 23. Dir./Mgr. Sys. Development, Sys. Architecture
  - 31. Mgrs., Suprv. of Programming, Software Dev.
  - 32. Programmers, Software Developers
  - 60. Sys. Integrators/VARs/Consulting Mgt.
- OTHER COMPANY MANAGEMENT
- 11. President, Owner/Partner, General Mgr.
  - 12. Vice President, Asst. VP
  - 13. Treasurer, Controller, Financial Officer
  - 41. Engineering, Scientific, R&D, Tech. Mgt.
  - 51. Sales & Mktg. Management

- OTHER PROFESSIONALS
- 70. Medical, Legal, Accounting Mgt.
  - 80. Educator, Journalists, Librarians, Students
  - 90. Others \_\_\_\_\_
- (Please specify)
3. COMPUTER INVOLVEMENT (Circle all that apply)
- Types of equipment with which you are personally involved either as a user, vendor, or consultant.
- A. Mainframes/Superminis
  - B. Minicomputers/Small Business Computers
  - C. Microcomputers/Desktops
  - D. Communications Systems
  - E. Local Area Networks
  - F. No Computer Involvement

Basic Rate: \$48 per year. \*U.S. Only

COMPUTERWORLD

E2032-2



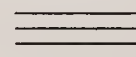
NO POSTAGE  
NECESSARY  
IF MAILED  
IN THE  
UNITED STATES

**BUSINESS REPLY MAIL**

FIRST CLASS PERMIT NO. 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

**COMPUTERWORLD**



P.O. Box 2044  
Marion, Ohio 43306-2144



# PCs & WORKSTATIONS

## COMMENTARY

Patricia Keefe

### Money for nothing



It's a mad, mad world out there for software vendors struggling to make a buck. Borland International and Lotus have both sustained major hits to their stock value despite profitable quarters. Borland investors were unnerved by Lotus' copyright infringement suit, while Lotus shareholders damned that company for predicting a weak third quarter.

Ashton-Tate continues to hang by a thread, bolstered solely by a committed user populace. Even Microsoft, which managed to top the billion-dollar mark in sales for fiscal 1990, is predicting lower profit margins next year while it pours good money after bad in an effort to crack Novell's grip on the LAN-locked.

So what gives? All of these companies have come to one crossroad or another, and savvy users should realize that they not only hold the key to these vendor's financial futures but that they are in a position to help shape the way their product futures will look.

If users choose not to buy the cross-product platforms, the cleaned-up, revved-up or reduced-price products, or even to support forays into new

*Continued on page 42*

## EISA misses bus — for now

### ANALYSIS

BY MICHAEL FITZGERALD  
CW STAFF

While Extended Industry Standard Architecture (EISA) bus-based personal computer makers expect to sell tens of thousands of the machines this year, it will take EISA several years to catch on, say users and analysts. EISA boxes are also unlikely to be used as stand-alone machines, at least not for the next couple of years.

The 40 or so EISA vendors will ship approximately 160,000 machines in 1990, a fraction of the more than 7 million PCs that will be sold this year worldwide, said San Jose, Calif., market research firm Dataquest, Inc.

Despite this quiet beginning, and after almost two years of vigorous debate on the merits of EISA vs. IBM's Micro Channel Architecture (MCA) bus, analysts predict that EISA machines will eventually overcome the two-year MCA head start and outsell MCA machines, both in this country and throughout the world.

Still, neither architecture is expected to establish itself as the standard for microcomputers.

"The two of them are going to coexist, period," said Robert Charlton, an industry analyst at Dataquest.

"I don't see a fight happening for a de facto standard," said Andrew Seybold, publisher of "Andrew Seybold's Outlook on Professional Computing," an indus-

try newsletter based in Santa Clara, Calif.

IBM offers MCA in both 16-bit and 32-bit versions, with the 16-bit Intel Corp. 80286-based machines driving sales. The low

end for IBM will continue to keep its sales above those of EISA vendors for some time to come. Meanwhile, both the 32-bit MCA and EISA computers have limits that make them hard sells for vendors. In addition, MCA is offered only on strict licensing terms from IBM, so

*Continued on page 43*

### MCA's head start

IBM's Micro Channel Architecture is expected to hold its lead over the Extended Industry Standard Architecture, at least through 1994

	MCA		EISA
	16-bit	32-bit	
U.S. sales			
1989	628,000	311,000	under 1,000
1990	724,000	453,000	62,000
1994	988,000	1,255,000	1,822,000
Worldwide sales			
1989	1,221,000	603,000	1,000-2,000
1990	1,463,000	864,000	156,000
1994	2,059,000	2,979,000	3,716,000

Source: Dataquest, Inc.

CW Chart: Michael Siggins

## Sony pulls CD-ROM out of magnetic gutter

BY RICHARD PASTORE  
CW STAFF

SAN JOSE, Calif. — Sony Corp. unveiled a new generation of optical storage drives late last month with features it hopes will dispel CD-ROM's image as the poor, slow cousin of magnetic drives.

The four new compact disc/read-only memory (CD-ROM) drives deliver average access times of 0.38 seconds, which is a 25% improvement over the previous generation of Sony drives,

the company said.

Two of the drives also support the small computer systems interface II (SCSI-II), an advanced version of the SCSI standard that offers faster throughput, ability to connect more devices and an expanded command structure.

Support for the interface "will help advance the use of CD-ROM and other peripherals in the future," said Jay Bretzmann, a storage analyst at International Data Corp., a Framingham, Mass.-based research firm.

Sony has tweaked the drives' error-handling capability with new layered correction code and automatic internal dust cleaning. The four drives will be available in the fall, the company said. Prices have not yet been announced.

### Also in the lineup

Sony also introduced a write-once read-many (WORM) optical drive. The unit allows users to encode data permanently on special CDs for playback and retrieval.

According to Sony CD-ROM product manager Alan Sund, the WORM system could be particularly useful to government agencies and other users of highly sensitive information who, for security reasons, would prefer to

bring the CD-ROM production process completely in-house.

The \$30,290 WORM drive will be available in the fall, the company said. The WORM disks retail for \$30 apiece.

To prod the development of multimedia optical software, Sony also announced a CD-ROM XA audio encoder and personal computer interface card. CD-ROM XA is a standard supported by Sony, N.V. Philips Telecommunications and Microsoft Corp. for creating interactive multimedia training, point-of-purchase and electronic catalog applications.

The encoding card is available now at a developer's price of \$2,695; the interface card sells for \$399, according to the company.

## Micro Focus COBOL/2 Workbench™ Is a Hit!

We're very proud of COBOL/2 Workbench. And we're very gratified at achieving a weighted score of 9.6 when measured against corporate buyer preferences in a recent PC Week review.

From our mainframe COBOL compatibility features to our easy-to-learn, function key driven menu system, Micro Focus COBOL/2 Workbench is "equipped to support the experienced developer" making a transition from terminals to workstations for programming and maintenance tasks.

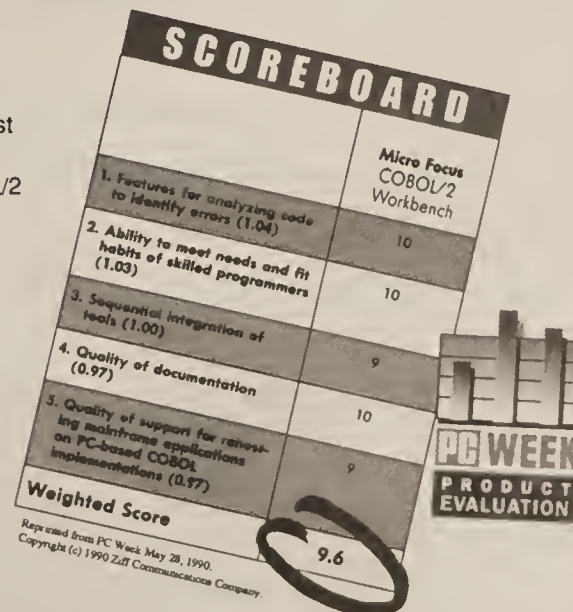
And there's more ... "Micro Focus belies COBOL's mainframe heritage with the artful design of the Workbench environment." ... and "Micro Focus' debugger, the ANIMATOR, lives up to its name with elegant displays that trace execution through structural diagrams as well as through highlighted source code."

If you or your organization want to improve programmer productivity, re-engineer existing COBOL applications for new needs, or develop high performance, easy to maintain business applications for PCs, LANs, or mainframes, give us a call at Micro Focus.

We sell "Better Way of Programming" solutions.

**COBOL/2 Workbench is a "superb interactive environment" and "professionally crafted," according to a recent product review.**

**MICRO FOCUS™**  
*A Better Way of Programming™*



Call Micro Focus today at 1-800-872-6265 and request a reprint of the entire PC Week review.

# *MICRO CHANNEL DIRECT AND DIRECTLY PR*



MODEL D3/MC CONFIGURATION  
SHOWN:  
BASE UNIT WITH 50 MB  
SCSI HARD DRIVE  
(17 MS ACCESS TIME)  
AND 64 KB CACHE.

You already know who Big Blue is.

Let us tell you who Big Woo is.

The full name is Daewoo, a \$22 billion mega-manufacturer of high technology and heavy equipment in use throughout the world.

Daewoo. The new parent company of Leading Edge, the brand that created the IBM-compatible market in the 1980's.

Backed by the global resources of Daewoo, Leading Edge has developed an important new computer. The Model D3/MC.

*A DAEWOO TELECOM COMPANY*

# LY LICENSED BY BIG BLUE. ICED BY BIG WOO.



Like the IBM® Model 55SX, the D3/MC has Micro Channel™ technology developed and licensed by none other than IBM. So you have a choice of running either DOS or OS/2® applications.

Like the IBM Model 55SX, the Model D3/MC is 386SX-based. But the D3/MC comes with four MCA compatible expansion slots, and hard drive models come with the SCSI controller standard. (With IBM, it's an option.)

And although the technology is IBM-reliable and IBM-compatible, the war-

ranty exceeds Big Blue's Model 55SX by eight months. This 20-month warranty gets even better if you become a D3/MC customer before September 30, 1990. You'll receive free on-site maintenance by experts from GE Service.\*

Oh yes, there is one thing about the D3/MC that is not IBM-compatible. The price. It's hundreds of dollars less.

Call 1-800-874-3340 for the authorized Leading Edge reseller nearest you. And get every edge you can.



*A GROWING COMPANY NEEDS EVERY EDGE IT CAN GET.*

\*OFFER APPLIES ONLY WHEN PURCHASED BY AND REGISTERED THROUGH AN AUTHORIZED LEADING EDGE RESELLER

# When you stack up the Microcom HDMS Dial-up Network Management System, you rack up the benefits.\*

## \* Easily Expandable.

HDMS's high density design makes it easy to handle growth in your network. You can grow from one to six chassis, with 32 modems per chassis, conserving critical computer-room space.

## \* High Speed, Error-free Transmission.

Dial-up speeds up to 38,400 bps are available, 100% error-free, keeping line charges at a minimum, and port availability at a maximum.

## \* Complete System Control.

Reports and monitors tell you who's using the network, when they're using it, and how well it's working — giving you complete control.

## \* Sophisticated Security.

Passthrough, Variable/Fixed Call-back, and Microcom's exclusive MNP Password Connection Security™ help make your host virtually hacker-proof.

## \* Multiple Host Access.

Port grouping lets you assign multiple hosts to a single chassis or system, providing least-cost call routing, space/cost savings and control of user access.

## \* Compatible Modems.

Integrated V.32, V.29FT, V.27, V.22bis, V.22, Bell 212A and Bell 103 modems deliver up to MNP Class 9 with V.42 compatible error correction. Works with standard, popular modems.



**How To  
Manage  
Your  
Dial-up  
Networks**

## \* Free Report.

To find out how HDMS can help you manage your network more efficiently and effectively, just call for this free report, "How to Manage Your Dial-up Networks".

Call toll-free, 800-822-8224 today.

Workstation  
Connectivity  
Worldwide

**Microcom**

500 River Ridge Drive, Norwood, MA 02062 617-551-1000  
Telex 710-336-7802 MICROCOM NWD / USA FAX: 617-551-1006  
Worldwide Distribution — International FAX: 617-551-1007  
Toll Free 800-822-8224

# New York Life sold on laptops

Insurance agents use PC-based underwriting as strategic sales tool

## ON SITE

BY MARYFRAN JOHNSON  
CW STAFF

In its own computerized version of one-stop shopping, New York Life Insurance Co. is rolling out an integrated sales system, with personal computers and laptops playing a pivotal role for agents in the field.

Roughly 1,000 of New York Life's 10,000 independent agents are already using the customized PC-based sales system, which enables them to plow through days' worth of paperwork in a matter of minutes.

"We can take an application and underwrite it right there on the spot, as long as the policy is for less than \$250,000," said Donna O'Driscoll, assistant vice-

president of New York Life's agency department. "We don't just take the information and send it into the home office anymore."

Within the next year or so, all 10,000 of the agents should be using the new sales system, she added. "Insurance applications will never be a 15-second operation," O'Driscoll said, "but this

helps the agent get all the correct information and not miss anything."

Whether the PC is generating payment schedules or graphically displaying a family's financial picture, it "really holds a client's attention," said Richard Paules, an Allentown, Pa.-based agent who was the first to test the new system. He uses an IBM Personal System/2 Model 60, which was recently upgraded to

80M bytes of memory on hard disk and 3M bytes of random-access memory.

"The whole logical series of steps just keeps people riveted to what you're doing," said Paules, a 30-year veteran of New York Life. "I think when the computer makes the calculations, it has a great deal more credibility."

Working with Logica Data Architects, Inc. in Waltham, Mass., New York Life's agency department set out to revitalize its existing sales system without moving to a new computing platform. The agency department is the main coordinator in recruiting the independent agents and supplying them with software programs and tools to aid their sales efforts.

Central to the challenge of designing the integrated sales system was the independent nature of the agents themselves. Most

of them buy and maintain their own PCs and laptops, using a variety of commercial software packages recommended by New York Life. The idea was to patch together

this disparate number of sales and illustration packages, client databases, financial needs analysis programs and even telemarketing scripts into one coherent system operating under Microsoft Corp.'s Windows.

"We were trying to use the good stuff we had

and develop what we knew we wanted," O'Driscoll said. While the system is known internally as NYL Express, the company's attempts to copyright the name have been unsuccessful so far.

In pulling the various applications under its own "software umbrella" development tool, Logica integrated New York Life's custom software with the PC packages that the agents were already using. Everything had to be seamlessly integrated so data could be moved from one application to another with a minimum of fuss and redundancy, said Shirley Singleton, project manager at Logica.

"These agents are not computer gurus. They didn't want to be rekeying data into nine different packages," Singleton said.

### On-line expert

The new system also includes an artificial intelligence-based "underwriter-in-a-box," which is customized from an expert system applications development package from Palo Alto, Calif.-based Aion Corp.

The Aion package is pre-programmed with underwriting rules, so an agent can type in information about a person's age, health habits and medical condition and get an immediate answer on whether the client is a good insurance risk.

The underwriting piece also gives NYL Express a cooperative processing spin, since it en-

ables the insurance firm to off-load some of the duties once performed by corporate mainframes.

Rather than manually filling out forms at the field offices and sending that information to be keyed into the mainframe database, the PC-based underwriter completes those steps in the field, Singleton said.

The bulk of New York Life's mainframe processing is done on IBM 3090s in its Clinton, N.J., data center or at the home office in New York. The 180 regional offices are equipped with IBM Series/1 minicomputers as well as some IBM Personal Computer-compatible PCs available for the agents' use.

Agents can dial into the Series/1 for security checks on potential clients or to download client files from the mainframe.

Paules said the new sales system is already well liked by the agents because their commissions arrive faster, fewer mistakes occur, and the whole process is telescoped into a few days rather than weeks.

The underwriter-in-a-box is particularly fascinating to many of the agents, he added. "It's great to be able to illustrate things and run a financial needs analysis, but the idea that a machine can decide whether someone is healthy enough or not for insurance is amazing to me," Paules said.

While many of the agents take their portables right into clients' homes, Paules said just as many insurance salespeople are probably working at the office.

"Years ago, the insurance man always went to the client, but I'd say now it's 50-50 with people coming into the office. I know I use the PC as a way of getting people to drop by my office," he said. "After they leave, I just upload all the information to the home office."



New York Life's Donna O'Driscoll: Sales system provides credibility



## Ogivar system combines power, portability

BY PATRICIA KEEFE  
CW STAFF

QUEBEC — Devoted laptop users who do not want to deal with the cost of having a second, stationary computer on their desk might want to check out a planned September offering from Ogivar Technologies, Inc.

Ogivar recently unwrapped the Interport Station, which is said to combine the portability of a 9.8-pound laptop with the capabilities of a full-size, IBM Personal Computer-compatible workstation.

The Interport Station consists of a desktop docking module that comes with a 101-key keyboard, a color IBM Video Graphics Array (VGA)-compatible monitor and a mouse; the module does not contain a microprocessor.

The module is mated to either Ogivar's Industry Standard Ar-

chitecture bus, 20-MHz Intel Corp. 80386SX-based laptop computer or to its Extended Industry Standard Architecture 33-MHz 80386-based laptop. The expansion module also provides the laptops with six expansion slots for communications, networking and add-in cards, as well as additional floppy or hard disk drives and tape or laser optical drives.



Ogivar's Interport Station features laptop portability and desktop power

The laptop segments can run MS-DOS, OS/2 or Unix and come standard with a 9-in. backlit VGA LCD screen; 1M byte of memory with 384 bytes of shadow random-access memory; a 3½-in., 1.44M-byte floppy drive and a 40M-byte hard drive; a serial interface and parallel port; a mouse interface; and an AC adapter connection. The laptops snap in and out of the station module.

The 386SX model costs \$5,395 and comes with a detachable two- or four-hour battery pack and an internal, half-size expansion slot. The higher speed 386-based model costs \$6,995 and runs on AC power only. Prices for both models include the docking station, keyboard and 15-in. VGA color monitor.

# DB2 ON YOUR PC

Develop full scale DB2 applications on your PC! Join the thousands of DB2 developers already benefiting from the productivity gains provided by the XDB-COBOL Workbench for DB2.

XDB puts a 100% DB2 compatible SQL DBMS and COBOL precompiler in your PC—seamlessly integrated with Micro Focus COBOL/2 and PC-CICS for interactive development.

Multi-user development can be supported by the XDB-SQL Database Server in MS-DOS, UNIX, OS/2, and Netware 386 environments.

"The only tool available that adheres closely enough to IBM's DB2 to allow applications developed on the PC to be migrated to the mainframe with little or no modification."

PC Week  
June 12, 1989

"Develop on PCs . . . then run the finished software without changes against DB2 data on mainframes thanks to XDB's DB2-compatible database server software."

DBMS  
January 1990

Interested in DB2 power on a PC?

Call (301) 779-6030

XDB Systems, Inc.  
7309 Baltimore Avenue  
College Park, MD 20740  
FAX (301) 779-2429



1990 XDB Systems, Inc. XDB is a registered trademark of XDB Systems, Inc. DB2 is a trademark of IBM. Other product names are trademarks of their respective holders.

# Borland spreadsheet makes a move

BY MICHAEL FITZGERALD  
CW STAFF

The jury remains out, but Borland International appears to have some votes in its favor, with several market research firms reporting that Quattro Pro has surpassed Microsoft Corp.'s Excel as the No. 2 spreadsheet.

More copies of Quattro Pro sold than copies of Excel in May, according to figures from La Jolla, Calif.-based research firm Computer Intelligence's (CI) PC Market Monitor Service, a monthly survey of 1,500 sites having 500 or more employees. The survey combines Excel sales for DOS and the Apple Computer, Inc. Macintosh, whereas Quattro Pro runs only under DOS.

The fact that Quattro Pro does not run under Microsoft Windows Version 3.0, released at the end of May, has boosted sales of Excel, according to distributors.

Dan Ness, a microcomputer industry

analyst at CI, said that Quattro Pro sales have been climbing steadily and that he expected it to remain at No. 2.

However, sales of Excel are flat, not dropping, and Lotus Development Corp.'s 1-2-3 spreadsheet, the target of Borland's slash-and-burn marketing attack, appears virtually unaffected.

"Lotus is slumping only slightly; most of [Quattro Pro's] growth is coming from the 'other' category, like [Computer Associates International, Inc.'s] Supercalc 5," Ness said.

"[Borland has] achieved some success, but not as much as it needs if it wants to continue chasing the leader the way it is,"

said Marshall Moseley, an analyst at Dataquest, Inc. "It needs to get into corporate accounts with multiyear, multiunit commitments."

A Borland spokeswoman said that since last October, the company has signed up 150 companies to commitments to buy 100 or more copies of Quattro Pro.

Several major distributors failed to confirm Quattro Pro's lead, however. Dataquest projected that Quattro Pro and Excel will each grab approximately 14% of the spreadsheet market this year, while Lotus will continue to hold a 52% share.

Ingram/Micro D in Santa Ana, Calif., showed Excel placing eighth and the Quattro Pro upgrade ninth on its charts. It also ranked the full-priced version of

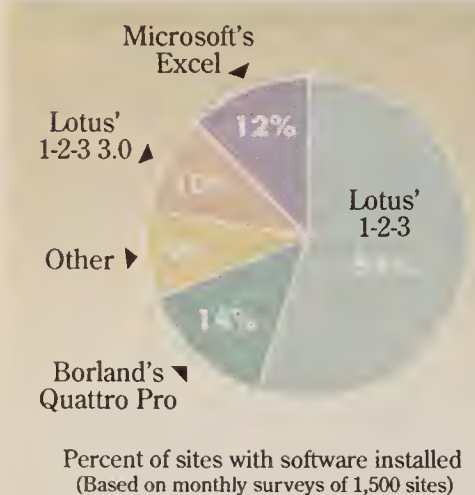
Quattro Pro 25th. Bruce Frederickson, Ingram's vice-president of marketing, declined to comment on whether the two combined were outselling Excel and added that the rankings did not reflect the release of Windows 3.0, which has "accelerated Excel sales 100%."

He also said that "Lotus is still clear and away the market leader, and 3.1 will be a good product when it comes out."

Two other distributors ranked Excel substantially higher than Quattro Pro. El Segundo, Calif.-based Merisel rated Excel No. 5 and Quattro Pro No. 17, and Corporate Software, Inc., a personal computer software and board reseller in Canton, Mass., does not even have Quattro Pro on the charts, while Excel consistently makes its Top 10.

## Spreadsheet shift

Borland has edged ahead of Microsoft into second place in the spreadsheet market



Source: Computer Intelligence CW Chart: Marie Haines

## Little folks pass on power

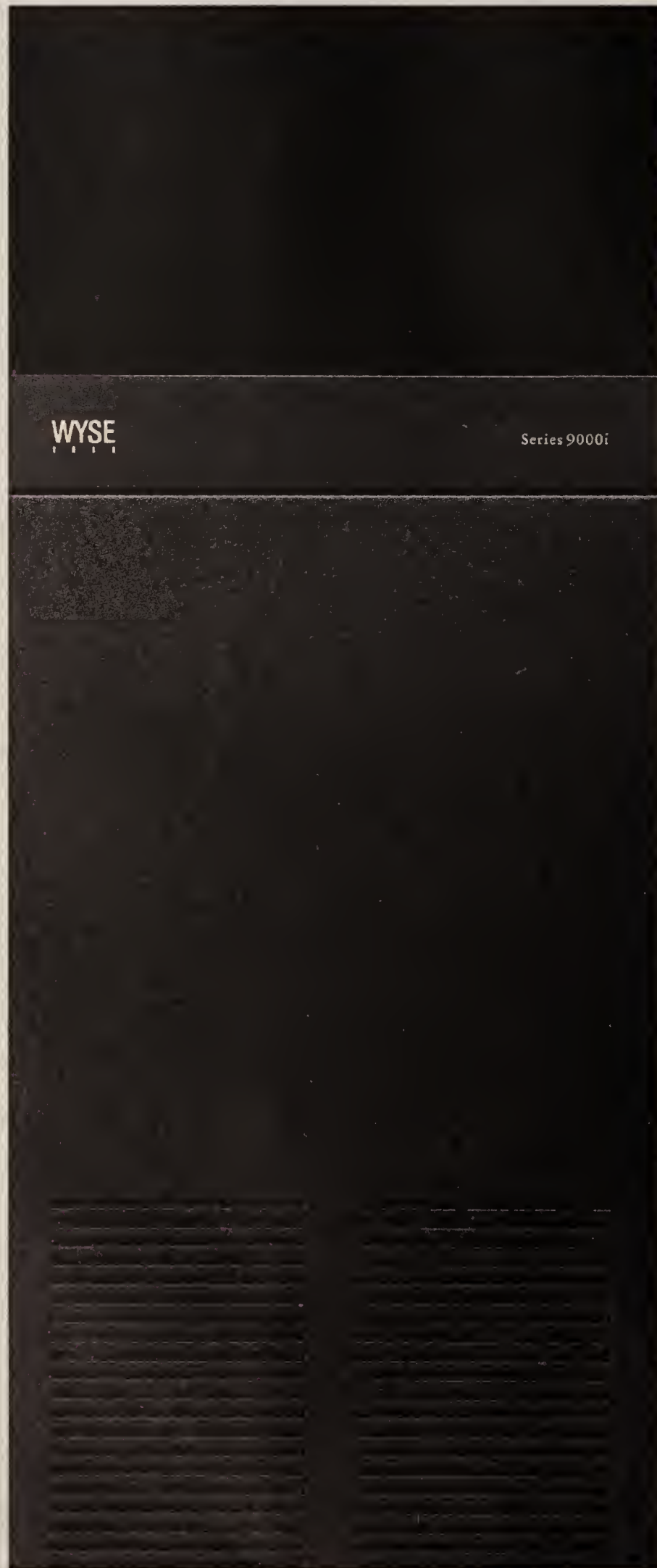
U.S. businesses with fewer than 100 employees will spend \$2 billion on personal computers by 1991, but the majority of the boxes will be low-end IBM Personal Computer-, XT- and AT-class machines, according to a recent study.

Among the 700 firms surveyed, 55% said they would purchase the low-end boxes, according to Business Research Group, a market research and consulting firm in Newton, Mass. However, a healthy 39% are also considering buying PCs based on Intel Corp.'s 80386 chip.

The high end of the PC range — Intel i486-based systems — interest only 9% of small business decision-makers, according to the survey. A similar percentage intend to buy IBM Personal System/2s specifically, while 15% will opt for Apple Computer, Inc.'s Macintosh, the study showed.

The study went on to suggest that the small business market, which constitutes 98% of all U.S. business enterprises, is a vast untapped market for PC networks. Only 27% of those surveyed said they use local-area networks.

RICHARD PASTORE



Introducing the Wyse Series 9000i. It delivers all the processing performance you'd expect from a super minicomputer—but at a fraction of the cost. A model of engineering elegance, streamlined yet powerful, it offers dynamically-balanced symmetric multiprocessing for anywhere from 16 to more than 250 users.\* Today. With a bus designed to take you much further. ■ Scalability is the key. The Series 9000i can expand from one to as many as six 386 CPUs. Or even 486s, right now. That means you can increase performance up **THE WORLD IS GETTING WYSE.**

to 14 times within the same chassis. And the performance gain with each added CPU is linear: unlike other multiprocessing technologies, when you double the CPUs, you literally double the power. The result is greater speed, efficiency and transaction capacity. ■ Because you can increase performance as your needs increase, the Series 9000i gives a growing company plenty of room to grow. And, since adding processors costs far less than replacing systems, it offers exceptional long-term investment protection. Over and above the upfront savings. ■ It's nothing short of a revolution in price/performance. And it comes from a company that made its reputation making advanced technology more affordable for more businesses.

■ Whether you're just making the move to the UNIX world or looking to replace an outmoded mini, now's the time to call Wyse at 1-800-438-9973. Because we're the ones who put the power of the mini within reach of the many.

# WYSE

1 800 GET WYSE

# Info managers form platform for application development

BY PATRICIA KEEFE  
CW STAFF

A distinct class of software, which includes personal information managers and groupware-based software environments, is being used by vertically oriented developers as an application platform.

Third parties can only be encouraged by reports such as one that appeared in a recent edition of the Windows Users Group Network's newsletter, which

claimed IBM is telling select corporate customers that the Microsoft Corp. Windows version of Current, its personal information manager, may become the standard interface for a Windows version of Officevision.

There appears to be "a good rationale" for creating a relationship between the Windows version of Current and Officevision, conceded Carmine Cordella, manager of personal information management and Officevision products at IBM's

Desktop Software Group in Milford, Conn. "We have announced that we are building a front-end version of Current that connects into Profs and Officevision/VM at the request of a large customer," Cordella said.

Also facilitating developer interest is the arrival of Windows Version 3.0. According to the June edition of "Andrew Seybold's Outlook on Professional Computing," Windows 3.0 has made it "possible to have a fully functional set of applications running directly under Windows 3.0 with the ability to get in and out of standard DOS applications without having to close them and store the files."

In short, Windows 3.0 has paved the way for more powerful and useful information managers. Personal information

managers provide users with a personalized desktop environment that enables them to categorize their information and files in such a way that, when working on any one subject, they are able to automatically access or pull together all related files and data.

For example, when using Current to prepare a budget meeting, the user is automatically linked to all of his electronically stored data pertaining to that budget. However, before personal information managers such as Current, Lotus Development Corp.'s Agenda and Polaris Software's Packrat can be used, users must create categories and build directories and databases.

In the case of a groupware environment such as Lotus' Notes, which functions less as a group application focused on a particular task and more for linking a user community together through various modes of communication, parameters must be set up before the package can really be used. This can be quite time-consuming.

## Ahead of time

A third-party market, along with some users, is just now beginning to address this problem by providing application "shells" that lay on top of these environments and take advantage of their capabilities. The shells address a particular need, such as trade-show planning, with built-in categories, directories and databases already in place.

"Customers can literally create a vertical application inside one of Current's data directories," Cordella said.

Richmond, Va.-based Positive Image Software has developed two vertical overlap applications for Current. One package assists trade-show exhibit managers in planning and managing related details, and a second package targets meeting planners.

"We have created data fields, task lists, form letters and categories that are relative to various aspects of trade-show and meeting planning; developed links between the files; and developed reports that take advantage of Current's capabilities," said Martin Darby, director of sales and marketing at Positive Image.

"We used Current as a development tool. If the user knows Current, then he already knows how to use the package," Darby added.

Darby started out developing a high-end application under Borland International's Paradox, only to find that many of the features he was developing under Paradox were already included in Current. So he decided to switch platforms and converted his application into an overlay for Current.

Agenda developer, reseller and newsletter publisher Eyeon Associates is also working on some customized shells for Agenda.

Users throughout New York-based Price Waterhouse have already written over 100 applications specifically for Notes, covering all aspects of the organization, National Technology Director Sheldon Laube said.

New Notes users are seeded with a few applications to get them going, and before long, they start creating new applications that tie into Notes' capabilities, Laube said. "These are the same people who are writing Lotus 1-2-3 macros," he said. "I used to worry about who would write the applications, and now I can't keep up with what's being produced."

## Wyse puts the power of the mini in the hands of the many. For a lot less money.



\*AIM Technology Suite III Benchmark, Dec. 1989

WYSE is a registered trademark and Series 9000i is a trademark of Wyse Technology Inc. UNIX is a registered trademark of AT&T. © 1990, Wyse Technology Inc.

## Keefe

CONTINUED FROM PAGE 35

markets, then there's going to be a lot of red ink flowing from software giants.

Now is the time to get involved. Ashton-Tate, for example, last week released Dbase IV 1.1, the long-awaited fix for Release 1.0's bugs. Incredibly, Ashton-Tate not only held onto most of its installed base, but user purchase surveys like the ones done monthly by Computer Intelligence in La Jolla, Calif., show that sales have continued to grow.

Users had such a heavy investment in Dbase code that many had no choice but to keep the faith and wait with toes tapping for Dbase IV 1.1. Dbase consultant Adam Green estimates there are thousands of backlogged Dbase IV applications ready to roll — if 1.1 works.

"If there are any problems with this release, Ashton-Tate is a goner," predicted Will Fastie, who edits "The Fastie Report," a Baltimore-based newsletter. "Any major problems will prove a major blow to Ashton-Tate's chances to continue as a major software company," agreed David Cearley, a software analyst

**I**F THERE ARE any problems with this release, Ashton-Tate is a goner."

WILL FASTIE  
"THE FASTIE REPORT"

at Gartner Group.

Even if there aren't any problems with Release 1.1, Ashton-Tate users still aren't out of the woods. Release 1.1 goes beyond the eight enhancements originally promised, providing 30, but the package is still dismissed as anywhere from two to four years behind the times.

Ashton-Tate's new management team has committed to interim releases every four to six months. "If it takes another two years for the next new product, they will lose more of their market," warned Michael Irwin, a police officer and systems analyst at the Metropolitan Police Department in Washington, D.C.

Irwin and other users said Ashton-Tate is reaching out to developers and users to get their input on what those new products should be and what features they should have. Here is the chance to make sure there are no more surprises.

Of course, Ashton-Tate is already hobbled from the start by one crucial blunder — denying for months that any bugs existed in 1.0. "That can only be viewed as having lied," Green insisted.

Once a promise for an upgrade was extracted, the ship date for 1.1 came and went with the changing of the seasons. This time around, if the company fails to listen, deliver or both, there will be no future for Dbase. Many users will just give up and walk away.

Lotus has been accused of being a one-product company and confusing its installed base with too many flavors of 1-2-3. But it's also true that Lotus has made investments in database, networking, groupware and CD-ROM technology.

Most of these efforts are still in the swaddling stage, and the company admittedly is picking its way through a mine field of unfamiliar territory. Users who

run their companies on 1-2-3 should get involved now.

Tell Lotus what you need to adopt these new technologies — features, pricing and platforms. Tell it how you want the products sold and supported. With Notes, for example, it hasn't a clue. Lotus has said so. So the "new" Lotus can't afford not to listen. They've already felt the sting of ignoring user interest in Microsoft Windows.

Borland has the marketing down pat. But how far can it go on the cheap? The competition discounts large orders, and sales from evaluation units of Paradox and Quattro Pro are running out of steam, Cearley noted. Then what? Does Borland have what it takes to support and service corporate accounts? What will Borland

have to do to get you to abandon your current platforms? We're going to find out during the next 12 months.

Mighty Microsoft faces an uphill battle with its obsessive need to take over the networking market. So far, users have been pretty indifferent to its efforts to field both a database server and a client/server architecture. OEMs haven't fared much better. The company has been forced to turn to the reseller channel, where fly-by-night network quacks abound. Microsoft expects to take it on the chin next year, so we know it's being realistic.

Microsoft is going to knock itself out trying to catch network managers' eyes. Users might as well take their best shot. Only a fool would spend the kind of money

Microsoft is going to have to spend and not listen to the buying public.

Users might start off by telling Microsoft that unless they see some clear evidence that the software developer and IBM will quit the Laurel and Hardy act and follow through with unity pledges on both LAN servers and OS/2, they'll patronize the Novell Network show. Microsoft does a good job of making IBM look foolish, but many users are more inclined to follow IBM's lead.

Users have never been in such a position to exert influence over the arbiters of microcomputer software. They'll have only themselves to blame if they don't.

Keefe is *Computerworld's* senior editor, PCs and workstations.

# PLATINUM Takes The



LT. COL. JOHN PAUL STAPP DURING HIS HISTORIC HIGH SPEED ROCKET PROPELLED SLED RUN HOLLOMAN AIR FORCE BASE, DECEMBER, 1954.

Is DB2™ causing you this kind of pressure?

As you confront the challenges of relational technology, are you being stressed by intimidating deadlines and unending demands for new applications?

And whether you're a DB2 novice or a veteran of many years, are you still struggling with DB2's complexity to accomplish even the most basic tasks?

That's where we come in...to relieve your DB2 stress like no other company can.

DB2 may be new to you, but it's not new to us. We're PLATINUM technology, inc., the only full-service software company specializing exclusively in DB2.

From our beginnings, PLATINUM's energies have been focused on delivering quality solutions that make DB2 easier to understand and simpler to use. We have created a complete line of products and services to make DB2 more productive for you and to make learning DB2 a lot less stressful for everyone.

**Corporate Headquarters** 555 Waters Edge Drive, Lombard, IL 60148 (708) 620-5000 FAX (708) 953-1923 US (800) 442-6861 Canada (800) 848-0140  
**Corporate Sales Offices** Houston, TX (713) 894-4500 Los Angeles, CA (La Mirada) (213) 926-5544 New York, NY (212) 564-7300 Sacramento, CA (916) 489-1464 Waterbury, CT (203) 756-3000  
**Domestic Affiliates** Boston, MA (617) 451-0900 Chicago, IL (Schaumburg) (708) 303-0445 Cleveland, OH (Mayfield Village) (216) 646-1529 Dallas, TX (214) 620-9001 Detroit, MI (Southfield) (313) 354-5504  
Hartford, CT (Glastonbury) (203) 633-4646 Milwaukee, WI (Brookfield) (414) 797-8859 Minneapolis, MN (612) 335-3660 Portland, OR (Wilsonville) (503) 682-4532 Washington, DC (Reston, VA) (703) 620-6500  
**International Affiliates** North Sydney, Australia 61 2 9573755 Vienna, Austria 43/222/53 36 899 Copenhagen, Denmark 45-39 271120 Northampton, England 44 604790959 Espoo, Finland 358 0 80 39 011  
Paris, France 33 (1) 49 59 63 63 Tel Aviv, Israel 972 3 5622833 Milan, Italy (02)-21 57 851 Utrecht, The Netherlands 31 3 031-3048 Madrid, Spain 34 1 4 11 51 99 Geneva, Switzerland 41 22 48 50 00  
Zurich, Switzerland 41 41 66 58 00 Dusseldorf, West Germany 49/211/223028

IBM is a registered trademark and DB2, OMF, and CSP are trademarks of International Business Machines Corporation.

☐ **Yes, I'd like more information about:**

\_\_\_ RC/QUERY™

\_\_\_ RC/UPDATE™

\_\_\_ RC/MIGRATOR™

\_\_\_ RC/SECURE™

\_\_\_ PLATINUM Database Analyzer™

\_\_\_ PLATINUM Plan Analyzer™

\_\_\_ PLATINUM Report Facility™

\_\_\_ PLATINUM Data Compressor™

\_\_\_ PLATINUM Rapid Reorg™

\_\_\_ PLATINUM Pipeline™ for DB2

\_\_\_ The PLATINUM DB2 Guide™

\_\_\_ The PLATINUM Reference™ for DB2

\_\_\_ PLATINUM Education Series™

☐ I'm interested in hearing more about your **free 30-day trials.**

☐ I'd like to schedule an **in-house presentation.**

**PLATINUM technology**

The DB2 Company™



**(708) 620-5000**

**(800) 442-6861 (US)**

**(800) 848-0140 (Canada)**

Name \_\_\_\_\_

Phone \_\_\_\_\_

Title \_\_\_\_\_

Hardware \_\_\_\_\_

Company \_\_\_\_\_

Operating System \_\_\_\_\_

Address \_\_\_\_\_

DBMS/Release \_\_\_\_\_

City, State, Zip \_\_\_\_\_

TP Monitor \_\_\_\_\_

CW890



NO POSTAGE  
NECESSARY  
IF MAILED  
IN THE  
UNITED STATES

## BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 137 LOMBARD, IL

POSTAGE WILL BE PAID BY ADDRESSEE



PLATINUM *TECHNOLOGY, INC.*  
555 WATERSEDGE DRIVE  
LOMBARD, IL 60148-9930



## Nynex, Apple announce advertising system

Nynex Information Resources Co. recently teamed up with Apple Computer, Inc. to showcase integrated electronics and print advertising technology that is designed to enable marketers to seamlessly run multimedia advertising campaigns. Apple's Macintosh provided the hardware platform, and Nynex's Macrominds Director software served as the authoring system.

Computer Associates International, Inc. has opted to incorporate Rational Systems, Inc.'s DOS/16M DOS extender into several of its DOS-based products, including database and applications development packages. The extender allows CA to overcome DOS' 640K-byte memory access barrier.

Computerland Corp. customers now have greater rental options than before, thanks to an agreement between the retailer and A.I. Credit Corp. The computer retailer's 750 stores will have the option of offering both customized leasing programs and rental equipment financing provided by A.I. Credit.

Coopers & Lybrand and Applied Business Technology Corp. (ABT) are finalizing a licensing agreement that will integrate their systems development software into one combined system called Summit/Bridge. With the combined project management tool kit, managers can reportedly create a plan, assign resources and estimate each task in hours instead of days.

## EISA

CONTINUED FROM PAGE 35

some users consider it a proprietary system. Both architectures may be providing more than users really want right now.

"We simply don't need the power," said Hugh Naughton, Gas Research Institute's director of information systems.

Other corporate IS directors contacted concurred, saying that neither EISA nor high-level MCA-based machines figured in their near-term plans. The prices of the systems — at least \$10,000 for a 32-bit, 80386-based EISA machine — have also dampened buyers' enthusiasm.

Newly available second-generation EISA chip sets are expected to allow EISA vendors to produce boxes in the \$5,000 price range, but this still may not make a difference.

"I don't think there is a market for EISA machines in the low end," Seybold said. "The only way I could rationalize it is as a high-end machine for file serving or intensive graphics use, and the difference in the cost of the chip set doesn't excite me one way or another."

Those companies that have looked into the architecture give EISA mixed reviews. Continental Bank Corp. in Chicago, for instance, recently shunned EISA to standardize on MCA.

"We had originally planned to use Compaq's [EISA-based computers] but along the way decided that MCA was going to be more flexible for us in the long run, given IBM's Systems Network Architecture environment," said Marty Burns, local-area network administrator at Continental's Trust Division.

At the New York City Transit Authority, however, MCA was barely considered when the authority went looking for a file server to run a distributed application for scheduling subway operators.

"We liked what we saw" on a visit to Merrill Lynch & Co., which is using Compaq Systempros, said Patrick Farley, network administrator for the authority. "It outran the [IBM Personal System/2] Model 80, and for the critical nature of our application and future potential, the Systempro seemed fairly viable."

While there are probably less than 50 add-in cards available for EISA computers, mostly for network servers, at least one user was sold on EISA because of a specialized addition. David Klugman, executive vice-president of Tranzact Systems, Ltd., bought a Zenith Data Systems' Z-386/33E because it was so much faster than a 286 system that his firm was able to aggressively expand its market, as well as improve service for its regular clientele. Tranzact is a Homewood, Ill.-based on-line service bureau that processes freight bills for large corporations.

Klugman said Zenith's proprietary disk controller, rather than the EISA bus, made the difference for his company, giving customers the ability to do what would have been 40-minute searches on an Industry Standard Architecture 286-based system in less than five minutes.

It will be a while before EISA machines, or high-level MCA machines, make a splash in the market. Those companies that are buying such systems may not actually need the machines today.

"There's a lot of large corporations that know they're going to have to do something," Seybold said. "The others are the people who've succumbed to the [marketing hype for] a 32-bit bus."

# Stress Out Of DB2



PLATINUM's hands-on training courses cover all aspects of DB2, QMF, and CSP. All courses are available either at your facility or at one of our regional education centers.

- Introduction to DB2
- DB2 Database Design and Application Planning
- DB2 Database and System Administration
- DB2/SQL Application Programming
- CSP Application Programming
- Using DB2 and QMF

Our guides and reference manuals contain the most recognized and authoritative standards and guidelines for DB2.

- The PLATINUM DB2 Guide/Online™
- The PLATINUM Reference™ for DB2
- The PLATINUM DB2 Catalog Poster

All of our products and services carry the PLATINUM Quality Assurance Guarantee. Toll-free phone support is available 24 hours a day, seven days a week.

So if DB2 has taken you to your limit, why struggle any longer? Call PLATINUM technology at 1-800-442-6861 for more information, an in-house demonstration, or our exclusive no-obligation product evaluation.

PLATINUM offers all these administration, development, and end user software products for the perfect antidote to DB2 stress.

- RC/QUERY™
- RC/UPDATE™
- RC/MIGRATOR™
- RC/SECURE™
- PLATINUM Database Analyzer™
- PLATINUM Report Facility™
- PLATINUM Plan Analyzer™
- PLATINUM Data Compressor™
- PLATINUM Rapid Reorg™
- PLATINUM Pipeline™ for DB2

**PLATINUM**  
technology  
The DB2 Company™



---

THE LEADERS  
IN MULTIVENDOR  
CONNECTIVITY WIDEN  
THEIR LEAD.

---

No one is more familiar with multivendor connectivity than the people at Businessland. After all, we've designed, installed, and supported more multivendor networks than anyone else.

And we're still breaking

architecture make the host environment a lot easier to work with. Namely, the Apple® Macintosh®.

---

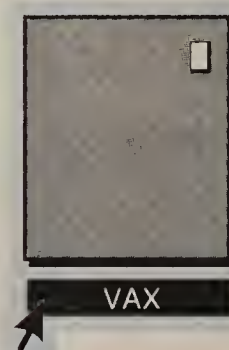
THERE ARE A  
HOST OF REASONS  
TO CONNECT WITH  
MACINTOSH.

---

Now there's an impressive suite of tools that lets you get more out of your investment in host applications.

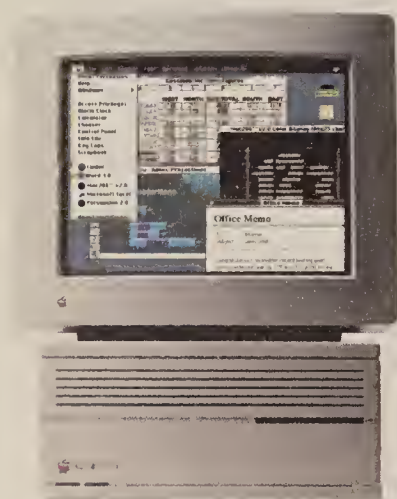
host applications that allow these applications to continue to evolve without modification of desktop software.

Not only does Macintosh connect into all environments, but Apple's Data Access Language makes it possible



for your users to request and update information from host databases—regardless of

# 20,000 Net We're Still Making

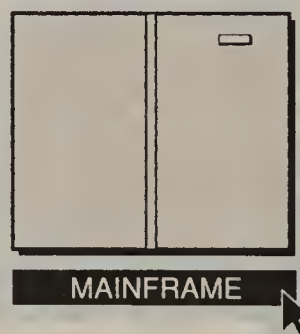


new ground—with a range of product offerings that give new

meaning to the terms “host accessibility” and “connectivity.” And we’re doing it with a computer whose graphical user interface and integrated

Thanks to third-party software known as Mitem-View™, your developers can quickly create a “point and click” interface for Macintosh-to-mainframe applications without making any host modifications.

And with a unique Mac-to-host software tool set known as Mac-Workstation®, developers can create friendly front-ends to



what type of network technology, host system architecture, or DBMS they are using.

Another developer tool, MacAPPC™, even allows the creation of Macintosh applications for cooperative processing in IBM's LU 6.2 SNA environments.

And with our newly formed alliance with KPMG Peat Marwick, Businessland can assist you in planning and developing exciting new

custom applications using these products.

---

### MACINTOSH CONNECTS TO THE BEST NETWORK SERVERS.

---

Another exciting development in Businessland's networking portfolio is the introduction of NetFRAME high-performance network servers, also known as "network mainframes."

OS/2 LAN Manager—as well as standard networking topologies like Token Ring and Ethernet.

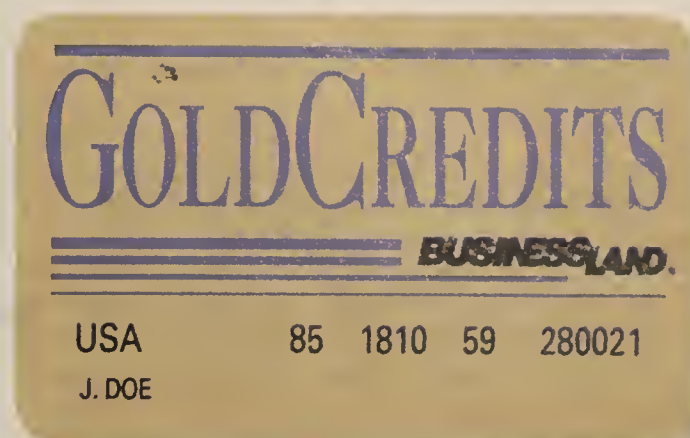
---

### THE BEST NETWORK SUPPORT FOR MACINTOSH.

---



In addition to providing all the hardware and software that is required to create



organization can have access to an extensive range of support services—including Solution Line Plus, our help desk and technical hotline.

# works Later, g Network News.



NetFRAME servers are considered to be the most powerful and reliable servers available today.\* And they are particularly well suited for Macintosh—with a built-in Apple LocalTalk® connection as a standard feature.\*\*

Not only that, NetFRAME servers support the most popular industry standard LAN operating systems, including NetWare 386 and

a successful multivendor network, Businessland offers everything it takes to get that network working. Everything from consultation and installation to LAN administration training and support.

If you choose to set up a Gold Credit account with us, for example, your entire

---

### IT ALL STARTS WITH A PHONE CALL.

---

To find out more about Macintosh connectivity and NetFRAME servers, and to receive a copy of a recent independent study conducted among MIS managers on the productivity benefits of Macintosh, contact us at 1-800-328-8383. Ask us to fill you in on all the network news.

**BUSINESSLAND**

A Different Kind of Computer Company

© 1990, Businessland, Inc. Businessland and the Businessland logo are registered trademarks of Businessland, Inc. Apple, Macintosh, AppleTalk and LocalTalk are registered trademarks of Apple Computer, Inc. All other product names are trademarks or registered trademarks of their respective holders. \*PC WEEK, May 7, 1990. \*\*Direct LocalTalk connections dependent on NetWare 386 NLM due Fall, 1990. Macintosh connection achieved today via standard bridges.

## NEW PRODUCTS

## Systems

Altima Systems, Inc. has announced a 16-MHz laptop computer.

The Altima Three incorporates an Intel Corp. 80386SX processor and includes a 40M- or

120M-byte internal hard disk drive. A cold cathode fluorescent tube LCD features 640- by 480-pixel resolution and offers support for IBM's Video Graphics Array.

The product's list price is \$4,999 for the 40M-byte model and \$5,400 for the 120M-byte

version. Both models are scheduled to be available next month.

**Altima Systems**  
1390 Willow Pass Road  
Concord, Calif. 94520  
(415) 356-5600

Texas Microsystems, Inc. has announced a Sun Microsystems, Inc. Scalable Processor Architecture-based workstation for use in harsh environments.

Hardsparc Model 9001 is compatible with IBM's Personal Computer XT and AT Industry Standard Architecture bus-based machines. It can run the MS-DOS or Unix operating systems and was designed to withstand shock, vibration and airborne contaminants. A rack-mounted color monitor with 1,280- by 1,024-pixel resolution is also available.

Pricing for a Model 9001 equipped with 8M bytes of random-access memory begins at \$16,995. The monitor costs \$5,995.

**Texas Microsystems**  
10618 Rockley Road  
Houston, Texas 77099  
(800) 627-8700

The MAX 386SX, a 14-pound, battery-powered portable computer announced by Transpacific Distribution Ltd., is now available for less than \$3,500.

The product includes an Intel Corp. 80386SX processor, a 40M-byte hard disk and a 1.4M-byte floppy disk. Other features include 1M byte of random-access memory (expandable to 5M bytes), an IBM Video Graphics Array LCD screen and a removable keyboard.

Each system is being shipped with MS-DOS Version 4.0.

**Transpacific Distribution**  
4224 California St.  
San Francisco, Calif. 94118  
(415) 221-6044

### Software applications packages

Evolution Computing has begun shipping Fastcad, its three-dimensional computer-aided design and manufacturing program, for \$2,995.

The package includes Fastcad 2D and Fastcad 3D and incorporates Pixar's Renderman. The bundled package enables users to create 3D photo-realistic images. A depth-mode feature allows users to place 3D points with a cursor, the vendor said.

It runs on an IBM Personal Computer AT or an Intel Corp. 80386- or I486-based Personal System/2 operating under MS-DOS Version 2.0 or higher.

**Evolution Computing**  
437 S. 48th St.  
Tempe, Ariz. 85281  
(602) 967-8633

### Board-level devices

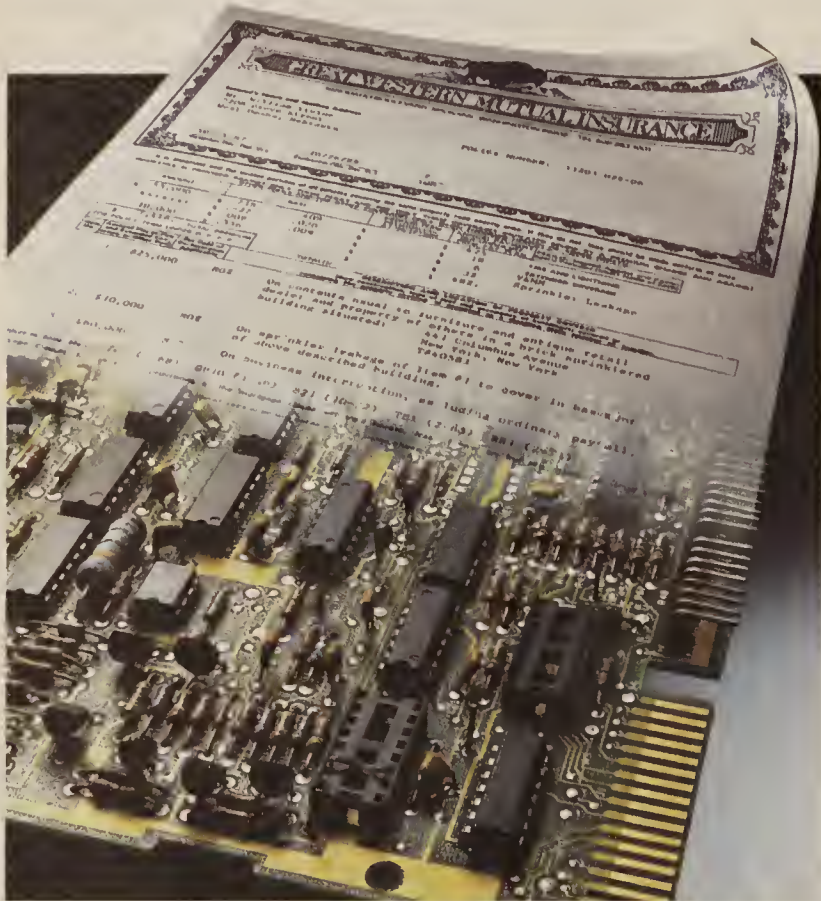
Dialogic Corp. has announced its multiline voice-processing boards for use with IBM's Personal System/2 Micro Channel Architecture (MCA)-based computers and compatibles.

The boards enable MCA-based computers to serve as a platform for voice-processing applications developed under the MS-DOS or OS/2 operating systems.

The Dialog/81-MC (\$2,550) records and plays back voice and performs outbound call analysis functions on eight channels. The LSI/80-MC (\$775) is an analog telephone interface board that connects to a D/81-MC to connect as many as eight telephone lines.

**Dialogic**  
300 Littleton Road  
Parsippany, N.J. 07054  
(201) 334-8450

© Eastman Kodak Company, 1990



**Capturing document images—and managing their information electronically—can bring efficiency and economy to your archival or time-sensitive document records.**

Whatever the size of your organization, Kodak Imagemaster equipment and software can simply, cost-effectively capture a paper image on microfilm and/or optical and/or magnetic media. Then you can interact with that image in much the same way you do with data. A few keystrokes and the document you need appears on screen, complete with marginal notes, endorsements, diagrams and signatures. In a totally integrated information environment, an image can then be printed, faxed, distributed over a network, or even used for response by phone.

We have more than 60 years of business imaging experience to share. Ask your KODAK Business Imaging Systems representative how image management can benefit your information management. **Call 1 800 445-6325, Ext. 330.**

# CAPTURE THE IMAGE. CALL KODAK

*The new vision of Kodak*



## COMMENTARY

Elisabeth Horwitt

### Best of both worlds



We seem to be on the verge of a shining new era, which could technically be defined as virtual voice and data

networking but strategically comes down to users being able to outsource their networking needs to carriers while still getting the benefits of private networks.

This is bad news for T1 equipment vendors like Network Equipment Technologies and Newbridge, both of which have reportedly had a rough time of it profitwise these last couple of quarters. But it's very good news for users.

An Amtrak project manager recently told me why his company switched from dedicated voice lines to AT&T's Software-Defined Network (SDN). "With SDN, we could tie our stations into our own four-digit network" and stop paying for unused dedicated bandwidth, he said. Furthermore, Amtrak is happy to "let somebody else" manage its voice operations, he added. "We're not a telephone company."

Asked whether his company is interested in AT&T's recently announced Software Defined Data Network, the manager said yes but added that he had

*Continued on page 49*

## Virtual nets hold overseas promise

BY ELISABETH HORWITT  
CW STAFF

EL SEGUNDO, Calif. — Those currently paying through the nose to use overseas public networks saw a break in the clouds last week, as Infonet announced its full virtual private data network offering.

Virtual Private Data Network (VPDN) is a family of network services that lets users enjoy all the benefits of owning their own T1 backbone without having to pay the personnel, maintenance and equipment costs associated with a private network, according to Vice-President of Product Marketing Michael Radice. The service is targeted at companies that are evaluating leased-line networks, as well as those currently paying \$15,000 or more per month for public data network services, he added.

Services such as VPDN are "a budding market that's waiting to happen," particularly in the international arena because of the high charges levied by foreign Postal Telephone and Telegraph (PTT) authorities [CW, July 23], said Frank Dzubeck, president of Communications Network Architects, Inc.

"Private international networks are extremely attractive because costs are embedded in there, but you've seen few of them because of the difficulty of reaching agreements with PTTs," he said.

However, Infonet's special relationship with PTTs — the company is jointly held by 10 of them, as well as MCI Communications Corp. — has enabled it to

"set the stage" for a new era of virtual private networking that will include other U.S.-based carriers and gradually will integrate PTTs' local services as well, Dzubeck said.

VPDN is virtually private in the sense that customers actually share bandwidth on Infonet's international T1 backbone of Network Equipment Technologies, Inc. IDNX switches. The

advantage of this setup is that Infonet takes care of maintaining and managing the switches, while customers gain private networking advantages such as fixed cost connections, sophisticated management features and rapid line deployment, Radice said.

Such pluses are particularly important in an international environment, according to Frank

Catalfamo, manager of corporate telecommunications at Storage Technology Corp. in Louisville, Colo. The international vendor of information storage and retrieval subsystems recently signed a \$1 million-plus, two-year contract for a customized VPDN network that links its headquarters to 10 subsidiary locations throughout Europe and Asia.

Since Feb. 1, when Storage Tek switched from a public data network to VPDN, the company

*Continued on page 51*

## FEATURE: USER GROUPS

### The new activism

BY MICHAEL HURWICZ  
SPECIAL TO CW

Digital Equipment Corp. probably didn't know what it was getting into when it began planning a Decnet upgrade with Open Systems Interconnect support. "User group members said, 'No. We will make a slow, orderly transition, and in the meantime, we must have TCP/IP,'" says Leslie Maltz, director of computing and communications resources at Stevens Institute of Technology in Hoboken, N.J., and chairperson of the Digital Equipment Computer Users Society (DECUS) product directions committee.

DECUS organized sessions on the topic at its national meetings and flooded DEC with electronic mail, Maltz says. DEC got the picture. Today, Transmission Control Protocol/Internet Protocol support is a key part of the networking product. "DEC listened," she says.

This scenario is being re-enacted around the country. Activist communications and networking user groups are becoming the rule today, often with encour-

agement from vendors who have become aware of the value of vigorous user participation in shaping product and policy decisions.

For instance, when the Affiliation of Netware Users (ANU) broke off from Netware Users

*Continued on page 51*



Joni Levy-Liberman

New Version!

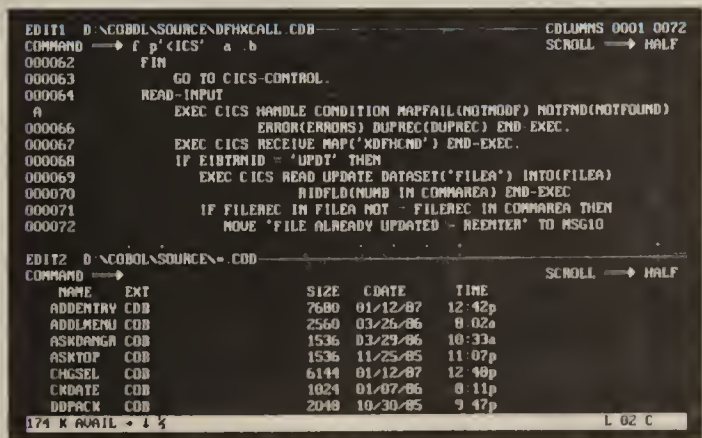
## Zero Learning Curve

### SPF/PC® 2.1

The MVS programmer will feel right at home using SPF/PC, the only PC editor functionally equivalent to editing on the IBM mainframe with ISPF/PDF, Release 2, Version 2.

SPF/PC fills the mainframe user's needs with a familiar environment, commands, large file support and micro-to-mainframe file portability. SPF/PC also offers:

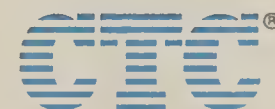
- true split screen
- directory/member lists
- command stacking
- hexadecimal editing
- 43-line EGA
- 50-line VGA
- picture strings
- user interface
- online help
- utilities
- binary editing
- network support



SPF/PC includes many PC-productivity features to save time and keystrokes, such as direct access to BROWSE and EDIT directory lists from the DOS prompt.

Want proof? Ask us for a **FREE**, interactive demonstration diskette.

SPF/PC — so much like the real thing, you'll forget you're editing on a PC.



Command Technology Corporation

1040 Marina Village Pkwy, Alameda, CA 94501 (415) 521-5900  
Orders: (800) 336-3320 FAX: (415) 521-0369 Telex: 509330 CTC

# Study says need for price caps waning

BY GARY H. ANTHERS  
CW STAFF

WASHINGTON, D.C. — Users of long-distance data communications services would see lower prices and richer product offerings if the Federal Communications Commission (FCC) removed all price controls from AT&T, according to a report published by a consulting firm specializing in industry regulation. The reason is that there is now vigorous competition at all levels of the long-distance market, said Multinational Business Services, Inc. (MBS), author of the report.

The analysis challenges a widely held view that the giant AT&T enjoys economies of scale that give it an unfair advantage as it attempts to fight off some 500 competitors in the long-distance marketplace. For example, MBS said that MCI Communications Corp.'s total operating costs are 13% lower than AT&T's on a per-minute-of-service-provided basis. That is based on public data from sources such as FCC filings and annual reports, MBS said.

The study goes further to say that even the smaller service providers are making inroads against AT&T. "The new accounts the small carriers are winning are their competitors' larger and more profitable customers," MBS said.

## No need for a watchdog

The FCC views price caps as one step on the way to a deregulated AT&T. The caps, which are paired with price floors, recently replaced the rate-of-return concept by which AT&T was allowed to base rates on a percentage markup of costs. The FCC said that caps protect consumers while passing on to the carriers the benefits of increased efficiency. The floors are intended to prevent predatory pricing.

Now, however, industry watchers and many users are saying the price caps and floors are an idea whose time has passed, if it ever arrived. "Most large users don't think price caps have much effect on prices or services," said Henry D. Levine, a Washington, D.C., attorney.

Bruce Levinson, co-author of the study, claimed that price caps are actually harmful to telecommunications consumers: "If they were removed, prices would decrease, probably significantly. That's why [AT&T competitors] oppose removal of price caps. They're not afraid AT&T will raise prices. They're afraid it will lower prices, and they're afraid of a price war."

Deregulation would also substantially stimulate the development of new services, Levinson said. He said that the burden of red tape as well as the price caps

themselves put a damper on AT&T's enthusiasm for bringing out new services. To the extent AT&T holds back, its competitors have less of an incentive to be innovative, he said: "Large businesses have special needs to combine voice, data, video and teleconferencing. They are suf-

fering because these services are slow to come out and because they are priced too high."

Some user groups are not so sure. Larry Blosser, an International Communications Association official, said, "It's not time to remove price caps." Giving AT&T complete pricing flexibili-

ty would encourage it to engage in "strategic pricing," in which prices are set to achieve long-term corporate goals, not necessarily the best interests of the consumer, he said.

However, Blosser acknowledged that the effects of more deregulation are not really known and that unleashing AT&T might work to the consumer's benefit in some areas

but not others. In particular, he said, the FCC has not focused on the effects that deregulation would have on data services for large users, concentrating on services aimed at small business and residential customers.

The report, "Interexchange Competition in the Price Cap Era," is published by Phillips Publishing Co. in Potomac, Md., and is priced at \$795.

# Presenting All The Sy Software You'll

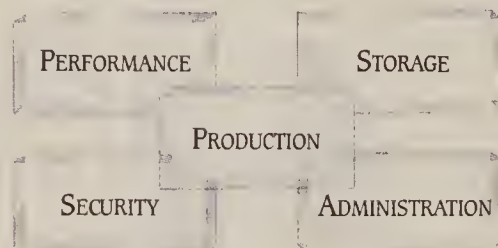
It's going to be quite a decade.

Every employee, every department, every division will be expected to do more—with less. Including the data center.

Especially the data center.

Demand for improved user service will reach new highs. Budgets and available resources will shrink. To succeed, data center managers will need to do the inevitable.

Automate.



Only CA-UNIPACK solutions enable you to automate entire functional areas of the data center. Working together they deliver the ultimate in data center automation and service level performance.

Automating data center operations is the key to delivering the service levels businesses need to compete in the 90s. And that's why so many companies are turning to us. Over the years we've helped thousands of clients automate their data center operations and today, according to Computer Intelligence, we offer more data center software solutions than anyone else in the world.

While hundreds of niche vendors each offer a few discrete products, our CA-UNIPACK® solutions can automate entire functional areas of the data center such as Production, Storage, Security, Performance Management, and Data Center Administration.

And now, with our new Computing Architecture For The 90s, the levels of integration and automation have been raised even higher. By sharing information and common services, the individual CA-UNIPACKS work together seamlessly

across multiple operating systems and hardware platforms.

The result is consistently higher levels of service. Improved response time. Investment protection. Maximization of personnel and hardware resources. And ultimately a new breed of data center.

A data center that enables you to play a critical role in helping your enterprise compete and succeed in the 90s.

One of the most critical areas of data center operations to automate is production. We can help you automate all of it with one single step:

## Production.



CA-UNIPACK®/APC—Automated Production Control.

It's the most advanced, and integrated package in the industry today and is currently used in thousands of MVS, VSE, and VM data centers around the world.

CA-UNIPACK/APC covers every aspect of automating production control processes including: automatic workload scheduling, automatic console message processing, automatic rerun/restart, automatic report

balancing, automatic report manipulation and distribution, JCL validation and automated job recovery.

CA-UNIPACK/APC integrates with other CA-UNIPACKS including the industry's most comprehensive, multimedia solution for system-managed-storage (SMS) and non-SMS environments:

## Storage.



CA-UNIPACK®/ASM—Automated Storage Management.

It's by far the best way to maximize your investment in storage and resource management. Unlike IBM's solution, CA-UNIPACK/ASM works in both SMS and non-SMS environments, and addresses both tape and DASD management.

Some of the benefits include: automated tracking of tape library inventory, early warning and recovery facilities, DASD performance measurement, chargeback, destruction protection and automated volume cleanup.

It's the most effective solution for managing both tape and DASD resources.



CA's Computing Architecture For The 90s protects and enhances the value of every CA software solution.

# Horwitt

FROM PAGE 47

heard it was quite expensive.

A lot of communications and information systems managers have been echoing the thoughts I heard at Amtrak. More importantly, they have been doing something about it, taking their voice off T1 lines and leaving

data to justify the price of dedicated connections. The Yankee Group recently projected that data will be responsible for a 35% growth per year in private-line bandwidth for the next few years, so it seems like the T1 equipment vendors have little to worry about.

However, the private T1 equipment market faces a far more serious threat now: in-

creasingly affordable virtual private data networking services such as AT&T's Software-Defined Data Network and Infonet's Virtual Private Data Network, or VPDN (see story page 47).

Like virtual voice networks, virtual data networks essentially offer users the chance to have a private network without having to buy, maintain and manage a

bunch of NET or Timeplex switches. The carrier owns the network and does all that for you. Users have the illusion of a private network but are actually sharing it with other companies.

Virtual data networks also promise to fulfill users' desire for on-demand bandwidth in flexibly sized chunks, as well as their desire to pay for just that chunk

of a T1 line they happen to need at any given time.

The idea is to get the best of both worlds: fixed costs for lines that support consistently heavy traffic; per-use costs for smaller sites that have sporadic traffic; and the ability to order up a chunk of bandwidth — say an hour's worth of 384K bit/sec. for a videoconference — with just a few minutes' notice.

Users are more apt to trade in their private networks for virtual network services now that carriers have proven their ability to keep networks up and running with only an occasional software glitch or backhoe disaster. This means that users can more confidently turn over the maintaining, operating and managing of their networks to the carriers — in effect, outsourcing their communications needs.

Of course, not all users will want to gut their internal telecommunications and network management staffs. Once you've

**O**F COURSE, virtual networks have a way to go before they deliver on all their potential benefits to users.

done that, you are totally at the carrier's mercy, and there is no turning back.

Some users, such as Merrill Lynch, have opted to keep a staff to look over their carrier's shoulder. The vendors themselves are responding to this need by offering direct hooks between their network control centers and users' Netview systems as well as on-line access to traffic and error statistics for any user with a PC.

Of course, virtual networks have a way to go before they deliver on all their potential benefits to users. This is particularly true on the international front, where Postal Telephone and Telegraph (PTT) authorities still reign supreme, and on the local loop, where the regional carriers are bringing out switched digital services with their customary snail-like pace. Since Infonet must resell PTT's lines, VPDN offers no price break over private networks. It will take time for U.S. carriers to gain the international presence they need to offer comparable services.

The lack of virtual services on the local loop means you still have to pay dedicated prices to get to the long-distance carrier's virtual network. Since Infonet only offers virtual networking overseas, "local loop" access VPDN consists of a leased line across the Atlantic.

Horwitt is a *Computerworld* senior editor, networking.

# Systems Management Need For The 90s.

CA-UNIPACK/ASM integrates with other CA-UNIPACKS including the most advanced security control and audit software in the world:

## Security.



CA-UNIPACK®/SCA—Security, Control and Auditing.

It offers you a secure, protected environment across multiple hardware platforms, operating systems and wherever your distributed processing takes you including MVS, VSE, VM, VMS, networks, DB2 and PC/DOS.

CA-UNIPACK/SCA gives you access control, VTAM network control, network session management capabilities and an automated approach to reviewing operating environments.

It also integrates with other CA-UNIPACKS including the most comprehensive performance management and accounting solution ever developed:

CA-UNIPACK®/PMA—Performance Measurement and Accounting.

CA-UNIPACK/PMA's integrated approach includes: comprehensive online performance monitoring and

## Performance.



historical reporting, expert system technology, resource accounting, chargeback, consolidated reporting and capacity planning.

This software solution also integrates with other CA-UNIPACKS including an automated, comprehensive approach to data center administration:

CA-UNIPACK®/DCA—Data Center Administration.

This integrated solution covers all aspects of data center administration including: inventory management, change management, configuration management and asset tracking.

It can help you produce instant and accurate network availability information. Quickly assess the impact of network failures. Produce current inventory reports. Provide consolidated reporting from multiple platforms such as IBM, Digital and PC's. Cut your vendor reconciliation time in half. Negotiate better maintenance contracts. And do many other administrative tasks that manual, error-prone methods simply

## Administration.



cannot handle.

Every one of these CA-UNIPACKS is supported by CA-UNISERVICE®/II. This unique service and support system offers you a direct link between your mainframe and CA's Customer Service around the clock—and around the world.

Altogether, these CA-UNIPACKS can help you create the most productive data center possible.

A data center that's ready for the 90s. For more information on CA-UNIPACKS and all the Systems Management Software you'll need for the 90s, pick up the phone and call 1-800-645-3003.

It could be one of the last manual tasks you do.

And the most productive.



© 1990 Computer Associates International, Inc., 711 Stewart Avenue, Garden City NY 11530-4787. All trade names referenced are the trademarks or registered trademarks of the respective manufacturer.

# Campbell soups up Mrs. Paul's EDI systems

## ON SITE

BY JOANIE M. WEXLER  
CW STAFF

PHILADELPHIA — At Mrs. Paul's Kitchens, Inc., operational costs — not fish — are scaled using automation.

It all began with the construction of a new data center last fall, which included replacing an IBM System/38 with an IBM Application System/400 midrange system, donated by the company's \$6 billion corporate parent, Campbell Soup Co.

The AS/400 is enabling the \$175 million subsidiary to bring its sales force — including brokers — up on an electronic data interchange (EDI) system for same-day turnaround on orders. The company is also using the system in conjunction with two ruggedized IBM Personal Computer AT clones from Nematron Corp. to track ingredient yields on the plant floor so a supervisor can adjust equipment in time to minimize waste.

Mrs. Paul's, which markets packaged frozen fish sticks and fillets to supermarkets and wholesale grocery warehouses, is currently conducting business electronically with 25 of its 70 brokers. The brokers — as well as Mrs. Paul's direct sales staff — can now tie into the Campbell system via the BT Tymnet, Inc. value-added network, using laptop computers to check on the status of their orders.

Mrs. Paul's can take an EDI order

keyed in by a broker at 9 a.m. and ship it from the appropriate warehouse by 3 p.m. that day, according to Vince Melchiorre, director of information systems at Mrs. Paul's. "The savings in the system are unbelievable," Melchiorre said.

Melchiorre pointed out that the fast turnaround is critical during the Lent season, when the company does 60% of its business.

Before bringing its brokers up on the EDI system — which is based on the Uniform Code Standard, a format for electronic business transactions in the grocery industry — brokers would fax their orders to Mrs. Paul's, and the company would enter them manually into Campbell's system.

"If we needed to ship an order the same day, we had to grab it, send it directly to the warehouse, and the warehouse had to manually take the order," Melchiorre explained.

The advantage of EDI to brokers, he explained, is that they receive a daily packet of electronic invoices delineating the orders they have brought in, so they can stay on top of their commissions.

In addition, "the brokers using the EDI system have the bigger percentage of orders," Melchiorre noted.

He said the company plans to have

50% of its orders received via EDI by the end of the year.

Other efforts at Mrs. Paul's this year



Mrs. Paul's Melchiorre finds savings from the firm's EDI system "unbelievable"

90 out of the finished product, what happened to the other 10 pounds," Melchiorre explained.

Factory workers in the sawing room now enter into the Nematron the number of pounds of fish they cut and the amount lost to fish "sawdust" and scraps. In the packing room, workers enter the number of pounds of finished cases they assemble. Using 5250 emulation, the data is sent into the AS/400, where an application program compares actual and standard yields.

"We need to know how much we're wasting because during the day, it's possible for the saws to get out of line and not cut the fish to spec," Melchiorre explained. "If we were to run all day in that situation, we could be yielding 80% or 85% — and that adds up to dollars."

Melchiorre said his next step is to automate the process by installing scales and counters so personnel don't have to enter in the data. "The scale would weigh each block as it goes by on the assembly line and record the weight right into the computer," he said.

In addition, Melchiorre said he is looking to install a local-area network to link the Nematrons and PCs "so the plant manager and everyone else have access to the same information the plant supervisor has."

One worry he has, though, is integrating his 80 PCs with his 15 Apple Computer, Inc. Macintosh computers on one network.

"There seems to be a need for someone to integrate the Mac and IBM worlds in LANs; the people who do that best are going to make a hell of a business for themselves," Melchiorre predicted.

## Demand for internetworking may work to nullify vendor strategies

BY JIM NASH  
CW STAFF

It is a case of learning the answer only to find out the question has been changed. Major players in the local-area network field have begun redefining their product strategies and, in some cases, their images to exploit the growth in network operating systems.

Even before networking companies can fully reposition themselves, however, IS administrators and analysts are discussing a second generation of networking products, one step up from LANs, that will manage networks of networks.

Provo, Utah-based Novell, Inc. recently began marketing itself as a LAN operating system outfit and licensing away its hardware products. Microsoft Corp., long the slumbering giant with its network operating system LAN Manager, has awakened to declare its long-term intention to usurp Novell's position as the nation's dominant LAN maker.

Both are out of step, according to some observers.

"Ten years out, I don't think people will be singing about some enhancement to [Novell's] Netware," said Karen Soskin, telecommunications specialist at

Miles, Inc. in Elkhart, Ind.

Soskin said that market excitement will likely be sparked by a system integrator's breakthrough with multiplexers, bridges, fiber-optic backbones and multiple-protocol communications software.

### The next generation

A report written by Mary Modahl, an analyst at Forrester Research, Inc. in Cambridge, Mass., referred to the next generation of networks as LAN internetworks. Modahl said administrators will be preoccupied with deciding whether to build internetworks in the image of LANs — with a variety of protocols — or to impose a single standard such as Open Systems Interconnect (OSI) or Transmission Control Protocol/Internet Protocol.

Boeing Computer Services, Inc. is already delving into the matter. Laurie Bride, manager of Boeing's network architecture, said she is working to organize the company's 14-plus protocols under the OSI banner. Bride said the company is currently building the Boeing Enterprise Network.

As part of the project, she is putting pressure on vendors such as Apple Computer, Inc., who have yet to adopt OSI compatibility.



## Learn to predict the future.

Amaze your bosses. Outwit competitors. Control your fortunes. Get hands-on experience shaping your future—with the world's finest cabling scheme.

Enroll in AT&T SYSTIMAX™ PDS Training Seminars.

Four-day class sessions are slated to run August 20-23, and October 22-25, 1990. Topics covered will include multivendor integration, architectural design, fiber vs. unshielded twisted-pair media selection, administration and installation hints, RFP design, and future growth and flexibility. To register, or for more information, call 1 800 554-6400. Ask for Course #28F.



© 1990 AT&T



YES, I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of \$38.95\* per year — a savings of 62% off the single copy price.

First Name \_\_\_\_\_ MI \_\_\_\_\_ Last Name \_\_\_\_\_  
Title \_\_\_\_\_ Company \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Address shown: ☐ Home ☐ Business ☐ New ☐ Renew Basic Rate: \$48 per year  
\*U.S. Only. Canada \$110, Central/South America \$130, Europe \$195, all other countries \$295. Foreign orders must be prepaid in U.S. dollars.  
Please complete the information to the right to qualify for this special rate.

**COMPUTERWORLD**



YES, I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of \$38.95\* per year — a savings of 62% off the single copy price.

First Name \_\_\_\_\_ MI \_\_\_\_\_ Last Name \_\_\_\_\_  
Title \_\_\_\_\_ Company \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Address shown: ☐ Home ☐ Business ☐ New ☐ Renew Basic Rate: \$48 per year  
\*U.S. Only. Canada \$110, Central/South America \$130, Europe \$195, all other countries \$295. Foreign orders must be prepaid in U.S. dollars.  
Please complete the information to the right to qualify for this special rate.

**COMPUTERWORLD**

1. BUSINESS/INDUSTRY (Circle one)  
10. Manufacturer (other than computer)  
20. Finance/Insurance/Real Estate  
30. Medicine/Law/Education  
40. Wholesale/Retail/Trade  
50. Business Service (except DP)  
60. Government - State/Federal/Local  
65. Communications Systems/Public Utilities/Transportation  
70. Mining/Construction/Petroleum/Refining/Agric.  
80. Manufacturer of Computers, Computer-Related Systems or Peripherals  
85. System Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services  
90. Computer/Peripheral Dealer/Distr./Retailer  
75. User: Other \_\_\_\_\_  
95. Vendor: Other \_\_\_\_\_  
(Please specify)

2. TITLE/FUNCTION (Circle one)  
IS/MIS/DP MANAGEMENT  
19. Chief Information Officer/Vice President/Asst. VP IS/MIS/DP Management  
21. Dir./Mgr. MIS Services, Information Center  
22. Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm. Network Sys. Mgt.; Dir./Mgr. PC Resources  
23. Dir./Mgr. Sys. Development, Sys. Architecture  
31. Mgrs., Suprv. of Programming, Software Dev  
32. Programmers, Software Developers  
60. Sys. Integrators/VARs/Consulting Mgt.  
OTHER COMPANY MANAGEMENT  
11. President, Owner/Partner, General Mgr.  
12. Vice President, Asst. VP  
13. Treasurer, Controller, Financial Officer  
41. Engineering, Scientific, R&D, Tech. Mgt.  
51. Sales & Mktg. Management  
OTHER PROFESSIONALS  
70. Medical, Legal, Accounting Mgt.  
80. Educator, Journalists, Librarians, Students  
90. Others \_\_\_\_\_  
(Please specify)

3. COMPUTER INVOLVEMENT (Circle all that apply)  
Types of equipment with which you are personally involved either as a user, vendor, or consultant.  
A. Mainframes/Superminis  
B. Minicomputers/Small Business Computers  
C. Microcomputers/Desktops  
D. Communications Systems  
E. Local Area Networks  
F. No Computer Involvement

E4032-3

1. BUSINESS/INDUSTRY (Circle one)  
10. Manufacturer (other than computer)  
20. Finance/Insurance/Real Estate  
30. Medicine/Law/Education  
40. Wholesale/Retail/Trade  
50. Business Service (except DP)  
60. Government - State/Federal/Local  
65. Communications Systems/Public Utilities/Transportation  
70. Mining/Construction/Petroleum/Refining/Agric.  
80. Manufacturer of Computers, Computer-Related Systems or Peripherals  
85. System Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services  
90. Computer/Peripheral Dealer/Distr./Retailer  
75. User: Other \_\_\_\_\_  
95. Vendor: Other \_\_\_\_\_  
(Please specify)

2. TITLE/FUNCTION (Circle one)  
IS/MIS/DP MANAGEMENT  
19. Chief Information Officer/Vice President/Asst. VP IS/MIS/DP Management  
21. Dir./Mgr. MIS Services, Information Center  
22. Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm. Network Sys. Mgt.; Dir./Mgr. PC Resources  
23. Dir./Mgr. Sys. Development, Sys. Architecture  
31. Mgrs., Suprv. of Programming, Software Dev  
32. Programmers, Software Developers  
60. Sys. Integrators/VARs/Consulting Mgt.  
OTHER COMPANY MANAGEMENT  
11. President, Owner/Partner, General Mgr.  
12. Vice President, Asst. VP  
13. Treasurer, Controller, Financial Officer  
41. Engineering, Scientific, R&D, Tech. Mgt.  
51. Sales & Mktg. Management  
OTHER PROFESSIONALS  
70. Medical, Legal, Accounting Mgt.  
80. Educator, Journalists, Librarians, Students  
90. Others \_\_\_\_\_  
(Please specify)

3. COMPUTER INVOLVEMENT (Circle all that apply)  
Types of equipment with which you are personally involved either as a user, vendor, or consultant.  
A. Mainframes/Superminis  
B. Minicomputers/Small Business Computers  
C. Microcomputers/Desktops  
D. Communications Systems  
E. Local Area Networks  
F. No Computer Involvement

E4032-3



NO POSTAGE  
NECESSARY  
IF MAILED  
IN THE  
UNITED STATES



**BUSINESS REPLY MAIL**  
FIRST CLASS PERMIT NO. 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

**COMPUTERWORLD**

P.O. Box 2044  
Marion, Ohio 43306-2144



NO POSTAGE  
NECESSARY  
IF MAILED  
IN THE  
UNITED STATES



**BUSINESS REPLY MAIL**  
FIRST CLASS PERMIT NO. 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

**COMPUTERWORLD**

P.O. Box 2044  
Marion, Ohio 43306-2144



# Activism

FROM PAGE 47

International last year to pursue an independent agenda, Novell, Inc. Chief Executive Officer Ray Noorda sanctioned it and Novell provided half the group's first-year budget of \$68,000.

Today, says Glenn Fund, president of the ANU, the group remains on good terms with Novell. For instance, Novell is participating in a new ANU service called the Family of Automated Central Technical Services (FACTS). FACTS will function as a clearinghouse where user recommendations will be collected, organized and submitted to ANU members, who will vote on the importance of each recommendation. The results will then be submitted to participating vendors for comment.

## Meeting users needs

Whether vendors encourage it or not, user groups are coming at them, sometimes in a spirit of quiet cooperation, sometimes with banners unfurled and trumpets blowing. Their express purpose is to get their needs met.

There are many examples of symbiotic relationships between vendors and communications user groups. The North American ISDN Users Forum, which acts as an information pipeline between ISDN users and vendors, has a close link with vendors.

W. Edward Hodgson, manager of computing and communications at Schindler Elevator Corp. and chairperson emeritus of the forum, says there is a free exchange of ideas between vendor and user. He attributes the open attitude of ISDN vendors to the fact that ISDN is a relatively new market in which vendors are aggressively seeking new ideas.

In the forum's case, user members submit ideas for ISDN applications. If an idea is adopted by the group, vendors create a specification for how that appli-

cation will be implemented. Once the application has been tested and stabilized, it is published in the Federal Register and in the proceedings of the forum. Morristown, N.J.-based Schindler has had 10 applications approved by the forum, according to Hodgson.

## Automatic IDs

One application that Schindler has already implemented is automatic number identification for customers calling a service center. Also accepted by the forum and slated for implementation at Schindler is an application that enables the firm to send Group IV facsimiles over ISDN, giving them a 64K bit/sec. fax network based on a central "fax PBX."

Once the forum accepts an application, Hodgson says, it has the weight of the whole user organization behind it. Thus, a small company with a good idea can have just as much impact as a large company.

Other user groups in more mature communications markets are not as fortunate. Hodgson contrasts the forum's experience with that of the Association of Data Communications Users (ADCU), for which he is chairman of the standards committee. The ADCU addresses the well-established general data communications market, in which vendors are not as actively seeking new applications. The ADCU's influence is more often a matter of several large users "getting on a vendor's case" than of vendors welcoming user ideas with open arms.

Sometimes, in fact, vendors don't welcome the ideas at all. Once, Hodgson says, the ADCU pressed several vendors to make their 56K bit/sec. digital devices compatible. "We did press and jump up and down and wave our arms, insisting that we needed a 56K bit/sec. standard. The result was that a Bellcore paper came out saying [the area] is undefined."

When changes do occur in

# A market resource

One reason that vendors often respond favorably to user groups is that they perceive them as a convenient and inexpensive market research resource. "DEC would come to us and say, 'We need people like the following — commercial people, people with particular expertise or from a particular market segment. And we would put together a focus group for them,'" says C.W. Goldsmith, a former president of DECUS, and now vice-president of Advanced Software Technologies in Los Angeles.

IBM uses Share in the same manner, Daniel A. Nottke says. "IBM knows the structure of the Share Communications Division. They know which group to talk to in Share if they're looking for input on 3745s, VTAM or Netview, for instance."

However, the effectiveness of such meetings oftentimes depends on the vendor's belief that the focus group reflects the buying preferences of a large potential market, says Thomas Nolle, president of CIMI, a technology assessment company in Voorhees, N.J. Lacking that belief, the vendor may be indifferent, says Nolle, who has been involved with a number of user groups, both for small and large systems.

A communications/networking user group can be a powerful lever for moving a vendor to a new position in product direction or policy, provided that the vendor believes the group represents an important market segment. In all, user groups say, their influence on vendors seems to be strengthening.

MICHAEL HURWICZ

mature markets, they are oftentimes incremental and undramatic. While users of large IBM systems in the Share user group are effective in influencing IBM, their influence usually extends to subtle points of highly technical products, according to John Canine, a senior systems manager at Merrill Lynch & Co. in New York and formerly a chairperson of Share.

Cannie says that IBM implemented enhancements to CLIST, the Netview programming language, in response to input from Share members. While not earth-shattering or even easily summarized, the changes were important to Cannie.

The most significant user group interventions often take many years to bear fruit. For example, Share issues white papers that outline users' requirements for various network and communications functions. Gen-

erally, such white papers take one to three years to complete, says Daniel A. Nottke, manager of systems software and communications at Arthur Andersen & Co. in Chicago and division manager of the Share Communications Division.

IBM typically stays in touch with users during the development of the white paper, Nottke says, so that products satisfying the requirements are often available almost simultaneously with the white paper's release.

This occurred when the Share communications division developed a network security white paper that consisted of a number of requirements aimed at securing the network as a resource as opposed to securing just the data or the computer system, Nottke says.

"I worked closely with 10 other IBM customers and several people at IBM," Nottke ex-

plains, "developing requirements, making sure IBM understood what those requirements said and what was the meat of the requirements — what we needed immediately and what could wait."

Within three months of the release of the white paper, two products were introduced that substantially embodied the recommendations of the white paper: Netview Access Services, which enables MVS or VM installations to connect terminals to applications; and the SNA Application Monitor, which allows terminal users to be notified of the status of applications they can access.

## User lobbying

Lobbying has become user groups' weapon to get their point across. For instance, Nottke says, Share developed a requirement for dynamically reconfiguring an Systems Network Architecture network without having to bring the computer or the network down. IBM responded to the initial proposal by saying that this was a long-range goal for IBM. That wasn't good enough for Share.

"We went back to IBM and told them exactly what we were looking for," Nottke says. "We refined the requirement to show why it was important and to state exactly what we needed to be able to do in specific instances."

In response, IBM gave a higher priority to the requirement. "Eight years ago, when I first got involved with Share, IBM was not as open as it is under its current market-driven philosophy," Nottke says. "Today, IBM comes out and talks to us, not revealing details of future products, but saying, 'We may be looking at this; what would you need to be effective in this area?'"

Hurwicz is a free-lance writer and consultant at the MTI Group in Eastsound, Wash.

# Virtual

FROM PAGE 47

has been saving \$20,000 per month," Catalfamo estimated.

"We now have dedicated lines, two to Europe, one to Asia, that we can pound through as much traffic as line capacity can handle without incurring any additional costs for the increase in volume," he added.

Infonet, which is still primarily an international packet-switched carrier, permits customers such as Storage Tek to employ packetization as a way to maximize use of its VPDN lines.

Storage Technology could have realized similar benefits by setting up its own private network. However, Catalfamo said, "I would have had to put consid-

erable up-front money for equipment and leasing of the circuitry.

"One other major benefit is the fact that I have access to Infonet experience in network management, which is especially important when you're dealing with foreign PTTs" and often coping with language barriers and customs differences, Catalfamo added.

"With the staff I now have, there was no way I could provide net management capabilities that my end users required."

## More staff needed

Catalfamo estimated he would have had to add a minimum of four people to his staff in order to provide the seven-day-a-week, 24-hour-a-day network support that is a prerequisite for an international private network.

Infonet currently has implemented IDNX nodes in 15 countries and plans to expand to other countries, particularly in Asia, Radice said.

User networks can be implemented in 21 days, Radice said. However, when networks involve countries where bandwidth is typically hard to come by, lead time can be quite a bit longer, he added.

VPDN is available in decentralized or centralized topologies. Users of the network receive facsimile reports on network availability, usage, and problems transmitted on a daily, weekly, and monthly basis. An optional service provides a customer's personal computer with on-line access to such statistics at one of the carrier's network control centers.

## BIT BLAST

# Complex bundles Netware

Complex, Inc., a Novell, Inc. OEM, has announced that it will offer Advanced Netware 286 Version 2.15 bundled with two 8-bit Complex Ethernet network adapter cards and a cc:Mail Express 8 electronic mail package at no extra cost. Complex sells primarily to distributors and resellers, who could elect to hand the freebies down to their customers.

A lifetime warranty on all Racal-Interlan Ethernet network adapter cards shipped after July 30 reportedly covers any defect in materials or workmanship for the life of the card, according to the vendor. The company said it will repair or replace any defective card at no cost to the customer.

Internetworking vendor Advanced Computer Communications said it has signed a network support agreement with Hewlett-Packard Co. to provide technical assistance to customers' networks incorporating both vendors' products. The companies will reportedly work together to diagnose and resolve network problems "with no finger-pointing."

NEW PRODUCTS

**Local-area networking hardware**

Morton Management, Inc. has announced that it is now shipping an Intel Corp. I486-based, 33-MHz Extended Industry Standard Architecture local-area network file server.

The Gigaserver 486/33 was designed for heavy industrial applications and data collection applications that require prolonged service. It supports operating systems such as Novell, Inc.'s Netware 386 and Banyan Systems, Inc.'s Virtual Networking Software. Other features include up to 16M bytes of random-access memory and 2.3G bytes of internal disk storage.

The product began shipping last month for \$15,995.

**Morton Management**  
12079 Tech Road  
Silver Spring, Md. 20904  
(301) 622-5600

BICC Data Networks, Inc. has introduced a two-port repeater equipped with one thin coaxial BNC port and one standard AUI port.

The Isolant 1121 Thin Ether-

net Diagnostic Repeater supports direct connections on thin Ethernet networks to a 10Base-T thick or thin coaxial or optical-fiber network. It is priced at \$1,250.

BICC also added diagnostic features to its 1120-2 and 1150-2 fiber-optic repeaters, which sell for \$1,250 and \$1,995, respectively.

**BICC**  
1800 W. Park Drive  
Westboro, Mass. 01581  
(508) 898-2422

**Local-area networking software**

A network modem-sharing software package has been announced by Fresh Technology Group.

Modem Assist lets users of local-area networks access up to 20 modems from any workstation on a LAN. Applications can continue to be run on a workstation while other users access the modem, the vendor said.

The product requires less than 10K bytes of memory and runs on an IBM Personal Computer AT, XT, Personal System/2 or compatible. It costs be-

tween \$495 and \$995, depending on number of modems used.

**Fresh Technology**  
1478 N. Tech. Blvd.  
Gilbert, Ariz. 85234  
(602) 497-4200

Connectworks Co. has introduced a product designed to link up to 16 IBM Personal Computers, compatibles or laptops in a work group by using standard telephone wire, a central switching unit and a software package.

Chainlink enables users to exchange files, send and receive electronic mail and share peripherals. A package that includes software for four PCs, a central switching unit, two 20-ft cables and four modular connectors costs \$395. Connections for eight or 16 PCs sell for \$595 and \$795, respectively.

**Connectworks**  
P.O. Box 497  
Wrightsville Beach, N.C. 28480  
(919) 256-2366

Corvus Systems, Inc. has announced a software program designed to enable a personal computer's hard drive to be shared by users of Apple Computer, Inc. Apple II and Macintosh systems or IBM PCs and compatibles.

Omnishare can accommodate

up to 256M bytes of data, depending on the type of PC configuration. It was designed for networks running Corvus' Constellation network operating system, but it is also compatible with Novell, Inc.'s Netware.

The product is priced at \$995.

**Corvus**  
160 Great Oaks Blvd.  
San Jose, Calif. 95119  
(408) 281-4100

**Network management**

Triticom has announced Arcvision, an Arcnet real-time traffic monitoring tool designed to operate with any Arcnet local-area network.

The device runs on any PC- or MS-DOS machine equipped with a standard Microsystems Corp.-compatible Arcnet adapter card. The product can track station, broadcast or total packet counts; instantaneous packet/sec. and peak packet/sec.; elapsed monitoring time; and reconfiguration bursts.

A single workstation version that includes a user manual and a 3½- or 5¼-in. floppy disk costs \$150. Versions with Arcnet adapters sell for \$325.

**Triticom**  
P.O. Box 11536

St. Paul, Minn. 55111  
(612) 937-0772

Microtonix Datacom Ltd. has announced a VMS-based communications system designed to increase efficiency of applications over wide-area networks.

The Packet Miser implements standard VAX/VMS terminal functions at end users' sites, thereby enabling hosts to channel I/O requests to remote sites for processing, the vendor said. Pricing starts at \$4,500 and varies according to configuration.

**Microtonix**  
125 Bessemer Road  
London, Ontario  
Canada N6E 1P9  
(519) 681-3430

Gateway Communications, Inc. has introduced a multiuser, multiprotocol communications system designed for users of Novell, Inc. Netware and Netbios local-area networks.

Comsystem provides LAN users with real-time access to diverse systems and remote data through one communications system.

The product can be installed on a Novell Advanced Network or Netbios LAN and configured as an IBM Systems Network Architecture or X.25 gateway for

**PRINT  
THICK  
FORMS  
WITHOUT  
COMING  
APART  
AT THE  
SEAMS.**

**DATASOUTH HIGH PERFORMANCE FORMS PRINTERS.**

these environments.

The product is available for \$6,995 and comes with a one-year warranty.

**Gateway**  
2941 Alton Ave.  
Irvine, Calif. 92714  
(714) 553-1555

Network Software Associates, Inc. has unveiled an enhanced version of its Adapt-SNA local-area network-to-mainframe gateway.

The product features complete IBM Systems Network Architecture (SNA) 3270 emulation using 58K bytes on each LAN workstation and was designed to meet requirements for low memory use for PC-DOS LAN workstations.

Adapt-SNA can be used on Token-Ring or Netbios-compatible LANs. Pricing starts at \$995.

**Network Software Associates**  
39 Argonaut  
Laguna Hills, Calif. 92656  
(714) 768-4013

Network Resources Corp. has begun shipping IP-Gate and Multi-Gate Mac, two gateways that provide connectivity between Apple Computer, Inc. Appletalk networks and Transmission Control Protocol/Internet

Protocol (TCP/IP) networks.

Multi-Gate Mac (\$795) features Appletalk and TCP/IP internetworking capabilities and runs on any Apple Macintosh II system.

IP-Gate (\$395) can be downloaded to a Multi-Gate 2000 router to provide an Appletalk-to-TCP/IP gateway.

**Network Resources**  
2450 Autumnvale Drive  
San Jose, Calif. 95131  
(408) 263-8100



**Cryptall's Series 3000 CB connects LANs to WANs**

Cryptall Communications Corp. has announced the Series 3000 CB, a high-compression bridge for connecting local-area networks to wide-area networks.

The product provides transmission speeds ranging from 4.8K to 64K bit/sec. and fea-

tures compression ratios of 6-to-1 for database files, 4.5-to-1 for text files and 2-to-1 for binary object files.

Standard features include a single 56K bit/sec. link for ASCII file transfers and advanced network diagnostic functions, the vendor said.

The list price is \$8,400.  
**Cryptall Communications**  
1110 Wellington Ave.  
Cranston, R.I. 02910  
(401) 941-7600

packet filtering and the ability to self-learn network configuration tasks. It was designed for Ethernet transmissions through encryption equipment but supports connections through other devices. The product costs \$9,500.

**Fibermux**  
9310 Topanga Canyon Blvd.  
Chatsworth, Calif. 91311  
(818) 709-6000

## Links

Photonics Corp. has announced a product that uses infrared light to link computers in one building with systems in another up to 600 feet away.

Building-to-building Photolink is mounted inside a window glass or near a window, rather than outdoors, and a Photolink transceiver is positioned at the end of each connection. RS-232 versions and versions compatible with Apple Computer, Inc.'s Appletalk routers and bridges cost \$3,390 per connection.

**Photonics**  
200 E. Hacienda Ave.  
Campbell, Calif. 95008  
(408) 370-3033

## Modems

Microcom, Inc. has announced a family of MNP modems designed for use in cellular environments.

The line includes Models C96 and M96, both of which are based on MNP Class 10. Both models yield throughputs of more than 9.6K bit/sec. over cellular telephone circuits.

C96 (\$899) was designed for central sites with fixed land-line connections on one end. M96 (\$999) was designed for mobile environments.

**Microcom**  
500 River Ridge Drive  
Norwood, Mass. 02062  
(617) 551-1006

## Front ends, multiplexers

Bytex Corp. has announced a cable management system that concentrates and extends multiple digital channels.

The Bytex Cable Manager supports remote port access for matrix switch applications, and two units can be combined as a stand-alone point-to-point cable multiplexing system, the vendor said.

The Bytex Cable Manager is scheduled to be available in September for \$2,995.

**Bytex**  
Southboro Office Park  
120 Turnpike Road  
Southboro, Mass. 01772  
(508) 480-0840

If your printer leaves your nerves as ragged as your multipart forms, then it's time to retire — the printer, that is. And pick up a Datasouth printer instead.

Only Datasouth printers are designed to go easy on you and your multipart forms. They're built to withstand grueling 100% duty cycles for years of trouble-free printing, even on your most troublesome forms.

Datasouth printers are packed with a multitude of solid features. Like a straight paper path to eliminate bunching and jamming. A high powered ballistic print-head to print legibly through forms up to six copies thick. A range of speeds from 180 to 400 cps. Even a zero tear-off feature for demand document applications.

And Datasouth printers are plug compatible with your standard hardware: ASCII minis and micros, DEC VAX systems, or IBM System/3X, AS/400, or 3270-type systems.

So before you and your forms go to pieces again, get rid of your old printer. And get your act together with a Datasouth. Call **1-800-476-2120** for the name of your nearest dealer.



© 1990 Datasouth Computer Corporation. DEC is a registered trademark of Digital Equipment Corporation. IBM System/3X, and AS/400 are trademarks or registered trademarks of International Business Machines Corporation.



**Datasouth**  
AMERICA'S HIGH PERFORMANCE  
PRINTER COMPANY

Please send me more information on the printers that keep my forms in one piece.

NAME

TITLE

COMPANY

STREET ADDRESS

CITY/STATE/ZIP  
( )

PHONE

Mail to: Datasouth Computer Corporation  
P.O. Box 240947, Charlotte, NC 28224

# My network in marketing won't share



## Now what?

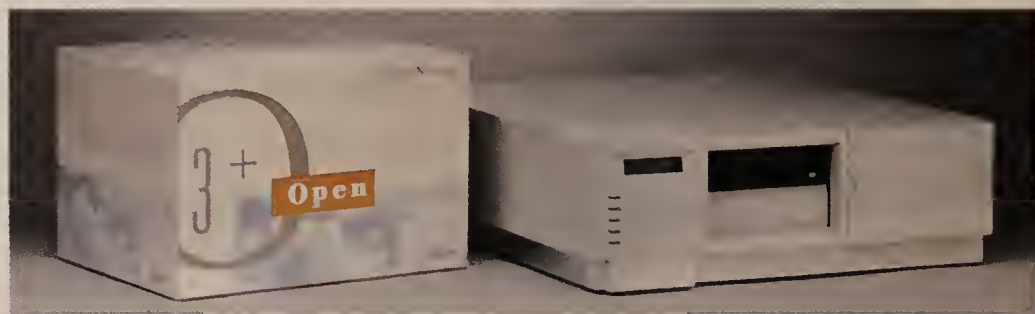
The latest directive from senior management is a doozy. Marketing and manufacturing must now share applications. As for all those different PCs and systems in place, management is "confident you can meet that challenge without incurring significant additional capital expense."

Now what?

For many corporate managers, the answer to that question is 3Com® 3+Open™ systems. 3+Open systems start with LAN Manager, co-developed by 3Com and Microsoft, and include the most extensive range of connectivity and electronic mail products.

It's a powerful computing platform with the flexibility to support both current business applications and emerging client-server applications.

3+Open systems let your people share information whether they use a PC, Macintosh, IBM, DEC,



# with the network in manufacturing.



HP or Bull host. What's more, 3+Open systems are compatible with DOS, OS/2, UNIX and Macintosh applications.

To enhance your network performance and security you can run 3+Open systems on 3Com 3Servers®, network servers designed exclusively for networks.

The result: a system that can actually leverage the value of the information anywhere in your company.

To find out how 3Com 3+Open systems are working in major corporations around the world, just call 1-800-NET-3Com, Dept. D5014. You'll also receive a brochure on 3+Open client-server systems.

At 3Com we make internetworking products and wide area networking products, as well as adapters, operating systems and servers. Because what good is sharing along one part of the network if you can't rely on the rest of it as well?

## 3Com

We network more types of systems  
to more types of systems.™

©1990 3Com Corporation, 3165 Kifer Road, Santa Clara, CA 95052. Telephone (408) 562-6400. 3Com, 3+Open, 3Server and the 3Com tagline are trademarks of 3Com Corporation. Macintosh is a registered trademark of Apple Computer, Inc. IBM and OS/2 are registered trademarks of International Business Machines Corporation. DEC is a registered trademark of Digital Equipment Corporation. HP is a registered trademark of Hewlett-Packard Company. UNIX is a registered trademark of AT&T. Bull is a registered trademark of Bull HN.

# The Promise Of AD/Cycle.



# Cincom Delivers It Today.



Realize the promise and the benefits of AD/Cycle, today. Cincom's advanced CASE environment helps you deliver the applications you need now using proven technologies that are compatible with the AD/Cycle components promised for the future.

Based on MANTIS<sup>®</sup>, the industry's most advanced development system, Cincom's integrated CASE environment features design, prototyping, process generation and testing facilities that will revolutionize the way you deliver applications. And these technologies are fully integrated with comprehensive project planning and control, docu-

mentation and impact of change features creating a development environment that spans the entire application life cycle.

With Cincom's advanced CASE environment even novice developers can deliver new applications in a fraction of the time and the cost it takes using alternative development methods. And with support for your data base: DB2, IMS, SQL/DS, VSAM and SUPRA<sup>®</sup> on your IBM systems or RMS, Rdb and SUPRA on your Digital VAX computers. Most importantly, you can reduce the time and expense of maintaining your applications by up to 90%.

The applications you build are portable across IBM's MVS, VSE and OS/2 environments as well as Digital VAX, Siemens, Bull, NCR and other platforms providing flexibility that can reduce costs and protect the investment you make in the applications that run your organization.

Implement the solution and realize the promise. Cincom's advanced CASE environment technologies.

Call today: 1-800-543-3010.  
In Ohio: 513-661-6000. In  
Canada: 1-800-268-9279.



*Delivering better solutions to provide better values.*

## EXECUTIVE TRACK



**Ray L. Dicasali** has been named senior vice-president and chief information officer at **Dun & Bradstreet Software** in Framingham, Mass.

He is responsible for all internal computer services, information systems, technical support, telecommunications and corporate services at the applications software vendor. He is a 15-year veteran of Management Science America, Inc. and will continue to be based in Atlanta.

Dicasali had been chief administrative officer at MSA since 1987, responsible for IS, legal and personnel functions. Before that, he was vice-president and general manager of MSA's Manufacturing Systems Division in Winston-Salem, N.C. He started his career as a systems engineer at Electronic Data Systems Corp. in Dallas.

Dicasali holds a bachelor's degree from the Georgia Institute of Technology and an MBA in finance from Florida State University.



**C. William Schleicher Jr.** has been named senior vice-president at **First Tier Data Services**, the IS subsidiary of **First Tier Financial, Inc.** in Omaha.

Schleicher was most recently an associate director at the Federal Reserve Board in Washington, D.C.

Schleicher holds a bachelor's degree and an MBA from Ohio State University and is a graduate of the Stonier School of Banking.

**Jon A. Baake** has been appointed director of the information resources management department of **Pension Benefit Guaranty Corp.**, a federal agency located in Washington, D.C.

Most recently, Baake was director of the U.S. Small Business Administration's office of information management. He also worked in IS development capacities for the U.S. Patent and Trademark Office. He holds an MBA from the University of California at Los Angeles.

## Fashioning systems for the future

*Levi Strauss' Rund designs readiness for change into world's largest apparel firm's IS*

BY JEAN S. BOZMAN  
CW STAFF

**T**he art of managing information systems starts with the task of designing them well. That is the thesis of Donna Rund, vice-president of information engineering at Levi Strauss & Co., who believes that thinking about computer-aided software engineering (CASE) is just as important as having programmers crank out lines of code.

To illustrate her point, Rund draws pictures of her business model of San Francisco-based Levi Strauss. It is a functional representation of intersecting circles, matching all the business units to the systems that support them. It is really a blueprint of the underpinnings of the world's largest apparel company. With annual revenue of \$3.6 billion, Levi Strauss operates on four continents and distributes its products around the world.

"If you don't have a clear picture of where you're taking your company, you tend to react to each new piece of technology for the sake of the technology itself," she says, sitting in her brick-walled office overlooking San Francisco Bay. "Our challenge in the '90s is to focus on *what* you do in DP and not on how you do it."

The very nature of IS is changing, and the people who work at information engineering, as Rund calls it, must change their job descriptions. "We're moving our people to be designers and systems integrators," she says. "There's still a need for technicians. But we're going to have a merging of skill sets between IS and the end user. People skills — like the ability to negotiate, facilitate and elaborate — will

### PROFILE: Donna Rund



Cindy Charles

**Position:** Vice-president of information engineering, Levi Strauss & Co.

**Mission:** Leading Levi's IS staff to gain new business skills and develop more responsive, flexible systems

make our people into knowledge workers."

Those workers have to be able to extract systems requirements from business unit managers who have never programmed a personal computer. They have to be able to listen — and to travel, if necessary — to where the business units are located.

They also have to build systems in a modular fashion so that, in Rund's

words, "applications development products can be popped in and out without affecting the overall systems design." They can no longer afford to be cloistered technicians, toiling away in isolation, she adds.

For example, Rund envisions that applications written for an IBM 3090 mainframe at headquarters will one day be transferable to IBM Applica-

*Continued on page 60*

## New IS yardstick: Earnings per share

BY CLINTON WILDER  
CW STAFF

**P**erhaps you have tried pitching a new system to the chief financial officer with a detailed, quantified rundown of its bottom-line impact. Have you ever thought of translating those numbers into actual annual earnings per share for your company?

One Minneapolis-based vendor of manufacturing resource planning (MRP) II software uses just that approach in its marketing. Fourth Shift Corp. pitches its MRP II system, Fourth Shift, with a formula to arrive at what it calls "MIS' magical elusive statistic" — the actual projected dollar value of its system translated into the user company's earnings per share.

"We've had some success with it," said Mike Naas, marketing manager at Fourth Shift, which has about 1,500

customers worldwide, including Eastman Kodak Co.

"MIS costs are so large in most companies that they are a significant portion of sales. Savings can be large enough to translate into cents per share," Naas said.

At a time when effective measurement of IS value in quantifiable terms is a key issue for credibility with senior management, Fourth Shift's approach is certainly worth noting.

This is how it works: Fourth Shift presupposes that because its MRP II system runs on networked personal computers rather than a mainframe or minicomputer, it is much cheaper to purchase and maintain. It does a cost comparison and tells the sales prospect how much his company could save compared with a mainframe- or mini-based system.

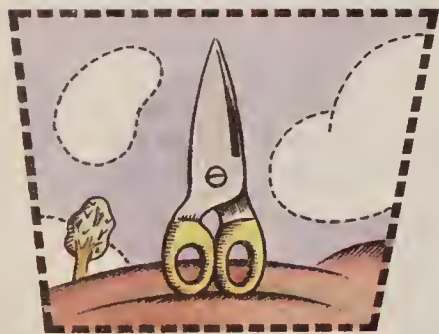


It then figures those savings as a percentage of the company's projected profits for the year. Since profits divided by the number of outstanding shares equals earnings per share, the IS savings figure, divided by the number of shares, results in the increased earnings per share gained from using the software.

Fourth Shift does not stop there, however. It then figures the company's stock price/earnings ratio based on its current stock price, multiplies the P/E ratio by the system savings and produces the figure showing how much its MRP II could actually raise the company's stock price.

If only Wall Street investors were so predictable — and had as much understanding of the value of cost-effective information systems.

## CLIPS



Tim Lewis

Summaries from leading scientific and management journals

In its latest issue, the *Harvard Business Review* devoted a majority of its articles to information technology management topics. The following is a sampling of pieces from that HBR.

### "The 'centrally decentralized' IS organization"

By Ernest Von Simson

Harvard Business Review  
July-August 1990

■ The pendulum seems to be swinging from decentralized information systems organizations back to centralized ones. The current challenge for today's companies is how to recentralize IS without losing the responsiveness to users that

decentralization offers.

A hybrid organizational model is emerging that will transcend the trade-offs between centralization and decentralization. The key to this new model is the sharing of power between IS managers and users.

In this organizational setup, the central IS group operates the consolidated computing and communications network, takes responsibility for staff and sets standards. However, individual business units determine the number of systems developers their areas can afford and set their own project priorities.

The hybrid organization gets the best of all worlds — the cost savings and control of centralization and the responsiveness and flexibility of decentralization.

### "Computers and the coming of the U.S. keiretsu"

By Charles H. Ferguson

Harvard Business Review  
July-August 1990

■ Despite being the leader in innovative technologies, the U.S. faces a bleak truth: Without imminent changes, U.S. and European hardware vendors risk becoming the subordinate research, prototyping and distribution arms of their Japanese competitors.

Reasons for this phenomena stem from our own technological advances. Digital technology has paved the way for mass-produced, inexpensive personal systems. Survivors in this market will need to excel in process technology, capital-intensive components, production and flexible high-volume assembly; in other words, companies able to manufacture components are gaining ground.

With this in mind, firms such as NEC Technologies, Inc., Canon U.S.A., Inc. and Sony Corp. have distinct advantages. Diversified, vertically integrated corporate complexes, they are embedded in financial industrial groups (known as *keiretsu* in Japan). They are able to make long-term investments in technology and manufacturing, command the supply chain from components to end products and coordinate their strategic approaches to block foreign competition and penetrate world markets.

The U.S. industry has failed to develop the tools for success in markets they have created by their own innovations. Several U.S. companies have made progress by creating special alliances, but to compete, they must continue to work toward a U.S. version of the *keiretsu*.

### "No excuses management"

By T. J. Rogers

Harvard Business Review  
July-August 1990

■ T.J. Rogers, founder and chief executive officer of Cypress Semiconductor Corp., says information systems have allowed him and other executives at the firm monitor business, anticipate problems, resolve difficulties and identify successful practices.

Rogers focuses on systems related to four critical activities: hiring outstanding people, setting individuals' goals and monitoring their progress, approving expenditures and granting pay raises that maximize motivation.

For example, employees enter goals and completion dates into a system every Monday. Managers and then top executives review these goals to eliminate conflicts and set priorities. Then Rogers and the top executives review reports on critical project goals, delinquent goals and employees without goals. Managers use monthly reports on individuals' achievements in performance reviews. The system uses a minicomputer, personal computers and standard PC software.

Rogers can get up to speed on a facility he wants to visit by reviewing goal reports for its people. He can peer into the bowels of the company to see what's going on. But the fact that he can do so means he seldom has to. "No vice-president or general manager wants to be in the awkward position where the CEO knows more about a situation than he or she does," he says.

## Anyone who says they can integrate SNA, TCP/IP and OSI must be from Jupiter.

Ask most communications companies about their capabilities and they'll tell you the sky's the limit. Just don't ask them to interconnect TCP/IP, SNA and OSI.

At Jupiter Technology, we understand that new networks must work with established networks and that integration must be smooth and transparent to your users.

Needless to say, it takes more than lip service to integrate multiple networks for Boeing, General Electric, NASA and others. It takes the backing of a

\$3 billion company with the proven expertise that only Jupiter Technology can provide.

Take a closer look at Jupiter. Call 1-800-525-4790 and ask for Literature Packet #JT01.

Because interconnectivity is no place to have your communications supplier explore the outer limits of their capabilities.



**JUPITER**  
TECHNOLOGY  
AN INTEL COMPANY

© 1990 Jupiter Technology, Inc.

# FAA takes heat for LA's air traffic control danger zone

BY GARY H. ANTHES  
CW STAFF

WASHINGTON, D.C. — The Federal Aviation Administration (FAA) is playing Russian roulette with air traffic in the Los Angeles area, hoping that patches to its 1960s-era computer systems will allow controllers to keep pace with burgeoning air traffic until a new system is in place several years from now.

That is the major conclusion of the latest in a series of reports from the U.S. General Accounting Office (GAO) that berate the FAA for problems in its mammoth overhaul of the nation's air traffic control systems.

According to congressional auditors, the Los Angeles basin, with 21 airports supporting 6.5 million flights per year, is one of the busiest and most complex airspaces in the world, and from 1986 to 1988 it saw the highest number of midair near collisions in the U.S.

Growth in air traffic has saturated the airspace and the computers that monitor it, the GAO said. Computers at the region's four large Terminal Radar Approach Control (Tracon) facilities have suffered from the sudden disappearance of critical aircraft identification from controllers' screens, along with flickering displays and slow system response, auditors said in a recent report.

Officials at the FAA would not comment on the report, saying the agency was reviewing it.

According to the GAO, the FAA has a plan for upgrading its existing systems on an interim basis, but it has no rigorous method for determining whether system enhancements will be adequate until a comprehensive new system is installed nationwide sometime in the mid- to late 1990s.

## MANAGEMENT BRIEFS

### Salary survey results released

Analyst- and programmer-level professionals received an average raise of 8%, increasing their salaries to \$33,400 this year, according to the annual information systems professionals salary survey by the Administrative Management Society in Trevose, Pa.

In the survey of five job levels, programmer/analysts received the largest average increase of 10.9%, while senior programmer/analysts, the highest level surveyed, averaged a 10% raise to \$38,300.

Personal computer specialists were included in the survey for the first time and earn an average of \$29,500, the survey said.

Victor Terranova at Geneva Generics, located in Broomfield, Colo., was elected president of Assist, the association of Andersen Consulting software users, for 1990-91. Former President Chip Lombardo at Trane Co. in Tyler, Texas, will serve as immediate past president.

One aspect of the plan, according to the GAO, would have Unisys Corp. upgrade existing computer systems. To do the upgrades, Unisys will have to restart a production line for the 1960s-vintage Univac 8303s. The units have 256K bytes of main memory and can operate at 500,000 instructions per second. However, both figures are far short of those boasted by modern high-end personal computers, according to the GAO.

The computers are programmed in,

and will be enhanced with, Ultra, a proprietary assembly language from Unisys that the GAO called "antiquated and cumbersome."

The GAO said the FAA is unable to measure computer capacity and predict performance needs. "Consequently, FAA did not recognize capacity shortfalls until controllers' ability to maintain safe separation of aircraft was impaired," the congressional agency said.

The FAA is beginning to use new software for determining the real-time performance of the systems, the GAO said.

The GAO report suggested that the Tracons are reacting to capacity problems rather than anticipating them. Reactions have included lowering system demands by reducing the number of

controller training displays and the length of time that systems retain flight data.

The GAO said the FAA had considered other options, including using a more modern system at a New York-based Tracon and considering proposals for new systems from IBM and BDM Corp. However, the FAA rejected these options because they were deemed too risky or slow to implement. As a result of the latest GAO probe, however, the GAO said the FAA has agreed to reconsider the New York Tracon option.

The GAO recommended that the FAA consider a broader range of systems options and that it establish a computer capacity and performance management program to pin down current and future requirements for the Los Angeles area.

# 10BASE-T NETWORK MANAGEMENT MADE EASY.

Cabletron's Remote LANVIEW™/Windows is the world's first network management software package to offer completely integrated world-wide desktop LAN/WAN management from a central control console.

With just a click of your Personal Computer's mouse, Remote LANVIEW™/Windows allows you to manage Cabletron's complete line of **Ethernet** and **Token Ring** products including twisted pair, coaxial and fiber hubs. Remote LANVIEW™/Windows also lets you manage Cabletron's local and wide area bridges as well as the 48 different types of DNI™ PC cards currently available.

Cabletron's Remote LANVIEW™/Windows lets you maximize network efficiency by providing color-coded mapping, alarm indicators, complete throughput and error breakdown features. Features you can't afford to do without. Features which make the job of managing your complex network easier than ever.

Call today for details or a live demonstration.

**Cabletron Systems**

The Complete Networking Solution

A New York Stock Exchange Company

**CORPORATE HEADQUARTERS**  
CABLETRON SYSTEMS INC.  
Cabletron Industrial Park  
Rochester, NH 03867  
603-332-9400

**INTERNATIONAL OPERATIONS**  
CABLETRON SYSTEMS, Ltd.  
Newbury, Berkshire, UK RG13 2PZ  
011-44-635-580000

## COMMENTARY

Les Gilliam

## Burnout blues



Being an information systems manager is certainly not getting any easier. The strain on both professional

and personal life becomes more than many can take. Hence, burnout continues to be a major problem.

Admittedly, every case is unique. But there are some common factors that seem to contribute to the high turnover among IS managers.

Dissatisfaction can be caused by an inadequate salary, a limited budget or antiquated technology. But rarely does the IS manager reach the stress limit because of these.

The greatest challenge to

the IS manager is probably the unreasonable demands from both superiors and users. Most IS managers are not miracle workers and cannot design, develop and implement quality systems overnight. Neither can the IS manager predict or avoid all human errors or software bugs.

Much of this lack of understanding by senior management and users can be solved through education, illustration and communication.

Some vendors and consultants offer seminars for both senior and line managers regarding the process and complexity of the system development and IS functions. Books and articles from periodicals may also be used to improve their knowledge of what are reasonable expectations for the delivery of products and services from IS.

Another wise step by IS management would be to prepare and maintain a list or database of system development projects, along with time, cost and staffing information on each. Gathering such information from outside sources would also

be helpful. There are some products on the market that have gathered such information and can be used for estimating purposes.

This illustrative data can be used to show user management the time and cost of various actual projects, helping to bring their expectations more in line with reality.

The third tool to use in battling misunderstanding is communication. This communication involves both procedures and progress.

The IS organization, which does not have or use sound methodologies for conducting its work, can expect less than outstanding results. Assuming such procedures exist, informing both superiors and users of the methodologies and their benefits will aid greatly in gaining their support.

Good communication also involves keeping others informed about the status of projects or processing that affects them. This includes telling the bad news as well as the good.

Senior managers and users should know that perfection is an

unrealistic expectation. If credibility has been established, users will usually be supportive through good times and bad.

Often, however, the one who places the most unreasonable demands on the IS manager is himself. The happiest person is usually one who knows his own strengths and limitations and just tries to do his best within those boundaries.

A second major challenge to the IS manager is time management, especially when a significant degree of control is in the hands of someone else. The far-sighted IS manager will block out certain periods of each day or week for reading, research, planning and creative thinking. He will also devote certain periods to physical exercise and recreation in order to maintain both physical and mental health. The use of a daily prioritized task list, which correlates with the monthly and annual planning calendars, will increase efficiency and effectiveness in the use of time.

Another challenge to the IS manager is when others make decisions or take actions that

affect IS significantly, without giving IS an opportunity to contribute. Quite often, these decisions call for sudden action by IS. It could be a large arbitrary budget cut, forced layoffs or a corporate merger.

Although such corporate action may force the IS manager to execute steps with which he may not totally agree, the future of the company, as well as his own career and that of his employees, may depend on a calm and positive response.

And finally, another challenge to the IS manager is the feeling of not being appreciated. William James, the 19th century psychologist said, "The deepest principle in human nature is the craving to be appreciated." Some superiors and users are not free with compliments. But seeking a performance review or asking for a critique may be a way to elicit a response, which hopefully will convey an appreciation for the IS manager's services.

Gilliam is president of Gilliam Associates, a computer management consulting firm based in Ponca City, Okla.

## Levi Strauss

FROM PAGE 57

tion System/400s at Levi Strauss factory sites around the world. Levi Strauss is currently using Knowledgeware, Inc.'s Information Engineering Workbench as the basis for its CASE design.

"Beyond that, the challenge will be to manage applications as the business changes," Rund says. One way to do that, she believes, will be to issue new applications "releases" in much the same way that software vendors do.

## Adaptable attitude

Her statements are in sync with the evolving management philosophy at Levi Strauss, which has undergone a leveraged buyout and drastic downsizing in recent years in an effort to stay competitive.

The watchword at the firm is flexibility, as IS planners employ electronic data interchange, IBM mainframes and relational databases to keep pace with other clothing manufacturers in Europe and the Far East.

"We are shifting the corporate asset from being the application code to being the design [of that application], which has lasting value," says Bill Eaton, chief information officer at Levi Strauss and Rund's boss. "The specific products you use to write that code are not as important."

Rund, he says, practices enterprise modeling: "In the information-engineering area, Donna is providing the vision of the kind of systems we want to build: flex-

ible, durable and responsive to changes in the technology environment. She is the glue that holds all of that together."

Today, Levi Strauss' worldwide IS staff numbers just 400, with about 325 in San Francisco and the rest supporting business units in Tokyo, Toronto and Brussels. "We've cut out many management layers, so that it's really a very, very flat organization," says Bob Mann, director of applied information technology. Mann manages Levi Strauss' CASE strategy and works closely with Rund on data design issues.

To make that flattened organization work, Rund and the other 13 IS managers reporting to Eaton have to work on motivating their staff to act as a team. "Donna has a lot of energy," Mann says. "She's able to get a lot of buy-in across [information resources] rather than vertically. Flattening the organization only works if people feel empowered, if they feel they are creating part of the destiny of Levi Strauss." That feeling is enhanced by an employee stock ownership plan that was established after the buyout in the mid-1980s.

Rund, who was named to her present position 2½ years ago, has been at Levi Strauss since 1980. Previously, she worked at several large banks and insurance companies as a software manager. In her off hours, she trains and shows horses. "It's like teaching a horse ballet, when you do it right," she says.

Rund wants IS workers to get out of the office occasionally so they can step back from their programming and concentrate

on the larger issues of information architecture. "We've had two-day off-sites in which we discuss the role of a manager and what it will be like in the future," she says. "Systems analysts will be working in the user environment. And with the new technology that's coming along, you won't have to be a programmer to design a system."

Rund's IS leadership sessions complement those of the rest of the company, which has a 2-year-old "Aspirations" program handcrafted by Levi Strauss' top management. The Aspirations mission statement, endorsed by Chief Executive Officer Robert Haas, lists six key management touchstones: new behaviors, diversity, recognition, ethical management practices, communication and empowerment.

## Relaxed and casual

The atmosphere at the Levi Strauss Plaza headquarters, along San Francisco's Embarcadero waterfront area, is relaxed. There is modern art on the walls, and attire is casual — often Levi Strauss jeans or jackets, in fact. Programmers work on IBM DB2 applications during the day, but they sit by the plaza fountain or sip capuccino at a nearby cafe at lunch.

The same messages are brought home at periodic off-site leadership weeks led by top Levi Strauss managers. In June, Rund took her turn leading a week-long off-site session in Santa Cruz, Calif. "Our off-sites are moving us ahead," says Hank Ahlgrim, manager of database administration.

"Our management has made it very clear to us that if you're

not activating creativity and empowerment, if you're not pushing authority and responsibility to those nearest the action, you won't survive in the 1990s," he adds.

In the end, Rund says, it is the people of Levi Strauss' IS group that will enable the overall business plan — or slow it down. "It doesn't matter which hardware

we're on or which telecommunications gear we have as long as that gear doesn't get in the way of moving the company forward," she says. "You have to have a vision of where you want to go and start working your way toward that vision. What we've been doing is learning how to adjust our internal business processes to a brand-new world."

## Levi's works on its element of comfort

Personal computer and terminal users at Levi Strauss will soon be getting the ergonomic treatment in work spaces specially designed to prevent repetitive stress injuries.

As the company remodels its work areas — the current ones are about nine years old — it is working with an architect to engineer adjustable and comfortable work spaces, according to Sherry Ryan, director of end-user computing. Ryan sits on a 1-year-old committee, called the Video Display Terminal Task Force, which is designing educational materials for employees and providing ergonomic input.

The 325 employees in information services have some custom work spaces now, Ryan says. "Employees come in all sizes. Some use different PC stands, some have nonglare screens and flat-panel displays," says Ryan, who has suffered from carpal tunnel syndrome, a repetitive stress injury of the hand, since 1984.

Although another member of the task force, company spokeswoman Mary Gross, says that Levi Strauss would invest in nonglare screens "only if shown to be necessary to health," Ryan says that there was little problem finding the money for such items in her department. The same goes for flat-panel displays, which some believe prevent potential health problems that may be caused by the electromagnetic field created by VDTs.

In conjunction with workplace redesign, the task force is also putting together an exercise video for at-the-desk activity — primarily stretching exercises.

J.A. SAVAGE

## CALENDAR

The MIS Training Institute will hold its 10th Annual Conference on Control, Audit & Security of Information Systems in Washington, D.C. Oct. 1-4.

The conference will feature speakers from Novell, Inc., IBM, the National Computer Security Center, General Dynamics, Computer Associates International, Inc., Lawrence Livermore National Laboratory, the National Institute of Standards and Technology and others. Topics concerning security issues from the standpoint of IBM systems software, networking, midrange systems, new technology, personal computers, productivity and legal issues will be addressed in 80 sessions.

For more information, contact Pamela Bissett at the MIS Training Institute in Framingham, Mass., at (508) 879-7999.

## AUG. 19-25

**Chipcord Seminar on Smartcord Applications.** Boston, Aug. 21 — Contact: Ben Haag, Amphenol, Hamden, Conn. (203) 281-3200.

**Doto Administration and Information Resource Development.** Boston, Aug. 22-24 — Contact: Julie O'Conner, Andersen Consulting, Andover, Mass. (508) 470-3870.

## AUG. 26-SEPT. 1

**Implementing Distributed Databases.** New York, Aug. 28-29 — Contact: Digital Consulting, Andover, Mass. (508) 470-3880.

**Marketing information Systems Seminar.** Orlando, Fla., Aug. 29-30 — Contact: Judy Price, Infomarketing, Tampa, Fla. (813) 376-6547.

## SEPT. 2-8

**Achieving Success in Strategic Planning.** St. Louis, Sept. 4-7 — Contact: Bonnie Sen, Washington University, St. Louis, Mo. (314) 889-5380.

**Focus on Automation.** San Francisco, Sept. 4-6 — Contact: Bonnie Walsh Associates, Staten Island, N.Y. (718) 979-1012.

**Fose's CD-ROM Conference and Exposition.** Washington, D.C., Sept. 5-6 — Contact: National Trade Productions, Alexandria, Va. (703) 683-8500.

**Great Southern Electronics and Computer Expo.** Jacksonville, Fla., Sept. 7-9 — Contact: Great Southern Shows, Jacksonville, Fla. (904) 743-8000.

## SEPT. 9-15

**Adding Image Processing to Information Systems.** Toronto, Sept. 9-11 — Contact: Technology Transfer Institute, Santa Monica, Calif. (213) 394-8305.

**Open Systems Applications Development Conference.** San Jose, Calif., Sept. 9-12 — Contact: Unify, Sacramento, Calif. (916) 920-9092.

**Automated Operations Symposium and Exhibit.** San Diego, Sept. 10-11 — Contact: Association for Computer Operations Management, Orange, Calif. (714) 997-7966.

**Doto Storage '90.** San Jose, Calif., Sept. 10-12 — Contact: Cartledge and Associates, San Jose, Calif. (408) 554-6644.

**Executive information Systems: From Planning to implementation.** San Francisco, Sept. 10-12 — Contact: Technology Transfer Institute, Santa Monica, Calif. (213) 394-8305.

**The Repository Conference.** Orlando, Fla., Sept. 10-12 — Contact: Digital Consulting, Andover, Mass. (508) 470-3880.

**Network '90.** Dallas, Sept. 10-13 — Contact: H.A. Bruno, Inc., Englewood Cliffs, N.J. (201) 569-8542.

**Video Expo.** New York, Sept. 10-14 — Contact: Debbie Totolo, Knowledge Industry Publications, White Plains, N.Y. (914) 328-9157.

**Unix international iSV Seminar.** Boston, Sept. 11 — Contact: Miller Communications, Boston, Mass. (617) 536-0470.

**Business Intelligence Conference.** New York, Sept. 11-12 — Contact: Richard Bennett, National Expositions, New York, N.Y. (212) 391-9111.

**Optical information Systems '90.** Arlington, Va., Sept. 11-13 — Contact: Meckler, Westport, Conn. (203) 226-6967.

Andover, Mass. (508) 470-3880.

**AD/Cycle: Evolution and Implementation.** Boston, Sept. 13-14 — Contact: Digital Consulting, Andover, Mass. (508) 470-3880.

## SEPT. 16-22

**Telecon '90 — The Evolving Telecommunications Environment.** Montreal, Sept. 16-20 — Contact: Kimberly Mungham, Canadian Business Telecommunications Alliance, Toronto, Ont., Canada (416) 865-9993.

**Mapping the Future of Computing and Communications.** Cambridge, Mass., Sept. 17-18 — Contact: Patricia Seybold's Office Computing Group, Boston, Mass. (617) 742-5200.

**DB/DC Users Group Conference.** Grand Rapids, Mich., Sept. 17-19 — Contact: The Fox Group, Troy, Mich. (313) 689-6777.

**Design Engineering Show & Conference/West.** Anaheim, Calif., Sept. 17-19 — Contact: Design/West, Stamford, Conn. (203) 964-8287.

**Graphics & Multimedia Conference and Exposition.** Long Beach, Calif., Sept. 17-19 — Contact: Exposition Management, Waltham, Mass. (617) 290-0400.

**Ink-jet Printing Conference.** Boston, Sept. 17-19 — Contact: BIS CAP International, Newtonville, Mass. (617) 893-9130.

**Dototech '90.** Manchester, N.H., Sept. 18-19 — Contact: Beverly Gove, New England Telephone, Manchester, N.H. (603) 641-1648.

**DISKCON '90.** San Jose, Calif., Sept. 18-19 — Contact: DISKCON, Sunnyvale, Calif. (408) 720-9352.

**Electronic Publishing '90 Conference.** Gaithersburg, Md., Sept. 18-20 — Contact: National Institute of Standards and Technology, Gaithersburg, Md. (301) 977-6711.

# How to fast forward your knowledge of the UNIX System.



## AT&T Videotape Training. Comprehensive, convenient, and low cost. From the creators of the UNIX System.

The AT&T Videotape Library. Superior UNIX® System training that's available whenever or wherever you are. In the office or at home, day or night. An invaluable reference tool, it's the most flexible way to increase your knowledge of the UNIX System.

Each course has its own workbook. And is designed with the quality you expect from AT&T... from full color graphics to video blackboards.

There are courses in UNIX System fundamentals. Security. Administration. Shell and C Language programming. Database Management Using INFORMIX-SQL®. And now, courses in Release 4.0

Administration, ANSI-C, C++ Release 2.0, and ORACLE® DBMS.

And AT&T offers a toll-free telephone support line. Giving you direct access to AT&T instructors.

Call now for more information.  
**AT&T COMPUTER TRAINING.**  
Come right to the source.  
**1 800 554-6400, ext. 7338.**  
Or send in the coupon below.

**AT&T Training, P.O. Box 1000, Dept. KD, Hopewell, NJ 08525-9988**

**YES! I want to fast forward my knowledge of the UNIX® System. Please send me more information about the AT&T Videotape Library.**



Name (Please print) \_\_\_\_\_  
Title \_\_\_\_\_ Phone ( ) \_\_\_\_\_  
Company \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

CWF08060

© 1990 AT&T

**AT&T**  
Computer Systems

UNIX is a registered trademark of AT&T. INFORMIX-SQL is a registered trademark of INFORMIX Software, Inc. ORACLE is a registered trademark of Oracle Corporation.

**INTRODUCING ETHERSPAN FROM CODEX, THE  
WORLD'S FIRST MULTIPLEXING LAN BRIDGE.**

Codex has just developed the most flexible,  
cost-effective way to link your Ethernet networks

*View of WAN Link*



*Codex  
EtherSpan*



*Other  
LAN Bridges*

to either a T1  
or Fractional T1  
backbone. It's our  
new EtherSpan,  
the only LAN  
bridge that lets  
you connect up  
to 24 separate

remote LANs through a single physical link.  
You can even allocate bandwidth in multiples  
of 64Kbps without changing hardware. So  
you lower both your hardware and line costs.

**THE ONLY LAN BRIDGE THAT BENEFITS  
FROM CODEX WAN EXPERIENCE.**

The technology that went into designing  
EtherSpan is the result of Codex's 28 years as an  
independent WAN vendor. Our extensive experi-  
ence in multi-technology environments is why  
we're able to put together the best-architected  
LAN/WAN solution for you. And why we built net-  
work management capabilities into EtherSpan  
to give you unequalled control.

If you'd like more information about the  
new Codex EtherSpan Bridge, give us a call at  
1-800-426-1212 ext. 7234.

And find out what good fortune it can  
bring your network.

**codex** | THE  
NETWORKING  
EDGE  
 **MOTOROLA**

**"THIS LAN BRIDGE  
COULD SAVE ME  
A FORTUNE!"**

# INTEGRATION STRATEGIES

## 'Soft' issues challenge imaging roll-in

BY ALAN J. RYAN  
CW STAFF

**A**s summer drags nearer to autumn, parents of 5-year-olds in Houston are preparing to send their children to school for the first time. Beyond buying Teenage Mutant Ninja Turtles lunch boxes and new school clothes, parents must obtain their child's birth certificate for school enrollment — a test of patience that previously meant waiting up to three hours at city hall.

Thanks to a new imaging system at Houston's Department of Health and Human Services, however, long lines will soon be forgotten. This fall, imaging technology in the Office of Vital Records will reduce the wait for most birth certificates to less than 15 minutes.

In many ways, integrating imaging technology into a business is a little like bringing young Houston school children into the classroom: Both have huge potential and are relatively easy to get in the door. It's only after the new arrivals are in place, according to imaging users and consultants, that the real work begins.

After installing imaging, "you've got a cultural change that is not to be taken lightly," warns John Koopman, vice-president and manager of the

PNC Education Loan Center at PNC Financial Corp in Pittsburgh, which put in an imaging system 18 months ago. At PNC, for example, clerical workers were previously assigned to handle repetitious jobs in an effort to maintain consistency and reduce errors. Now, Koopman says, with the chance of errors nearly eliminated by imaging, job rotation is encouraged to keep workers from getting bored.

Other users and consultants experienced with introducing imaging systems into organizations agree. They say that the so-called "soft" dimensions of imaging integration are often far more important than the mechanics of linking various systems.

Ronald W. Hanks, registrar of vital statistics at the Department of Health and Human Services, expects that imaging will greatly alter daily work. Because of imaging, he says,

"our total operation is going to change, and most of the job duties are going to change."

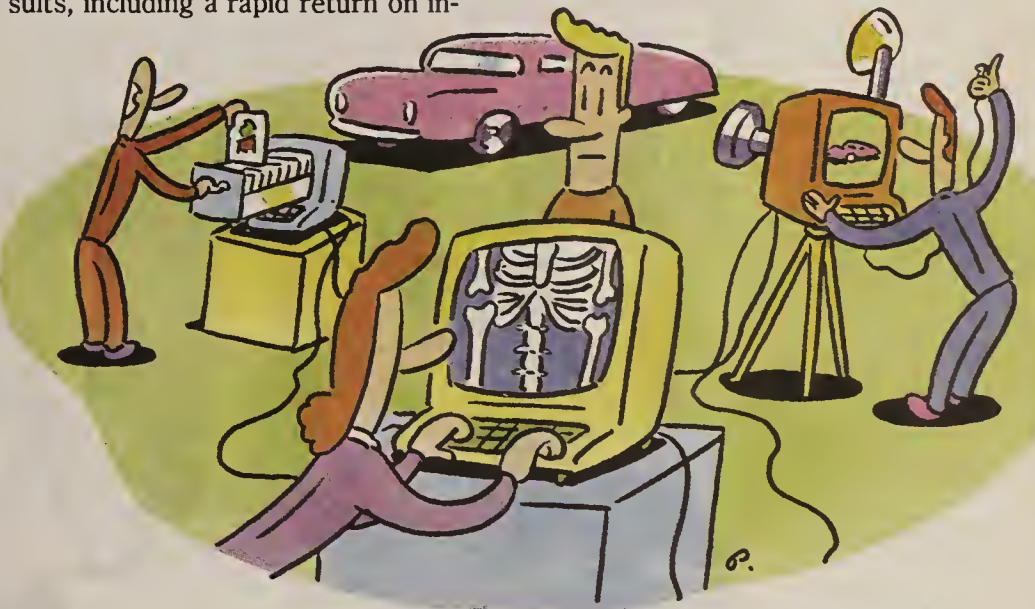
### Setup is the easy part

The concept behind imaging systems is fairly simple: "Electronic filing cabinets" are used to store scanned images of anything from letters, files and legal documents to mechanical drawings and X-rays on an optical disc. A single 5¼-in. disc can hold the equivalent of one four-drawer file cabinet.

Proponents of imaging technology say that wise choices of technology and projects can yield impressive results, including a rapid return on in-

vestment, improved customer service, savings in personnel costs and more efficient work flow — all without much disruption of existing computing systems.

Moreover, even greater gains are possible when imaging systems are linked or connected with other information resources, experts say. This linking is a tough technological challenge, according to users and consultants, but one that is doable and worth the trouble. That is clearly the belief of commercial systems integrators, many of whom are flocking to get into the imaging business (see *Continued on page 66*)



Phil Marden

## Custom tours at package prices? No problem

*New reservation system helps TWA travel unit and vacationers find a place in the sun*

### INTEGRATING THE ORGANIZATION

TWA Getaway  
Vacations

BY PAUL GILLIN  
CW STAFF

**I**f flying on the beach in some exotic, sunny locale is your idea of a great vacation, your hotel and travel options have always been pretty limited.

You could sign up for one of those five-night, \$399 vacation packages and take whatever limited hotel and air options the tour operator gives you or fork over thousands of dollars to design just the trip you want.

TWA Getaway Vacations, Inc. is using integrated information systems to give travelers the best of both worlds. "We are aiming for mass customization, giving the benefits of a mass-produced product on an individual basis," says Brad Corrodi, direc-

tor of MIS at TWA Getaway.

The trend toward customized tours at package prices is a significant one for the travel industry. The primary barrier to customized tours has always been informational. There are simply too many options and schedules to coordinate and still keep costs low. "This kind of business is substantially growing," says Robert Whitley, president of the U.S. Tour Operators Association in New York.

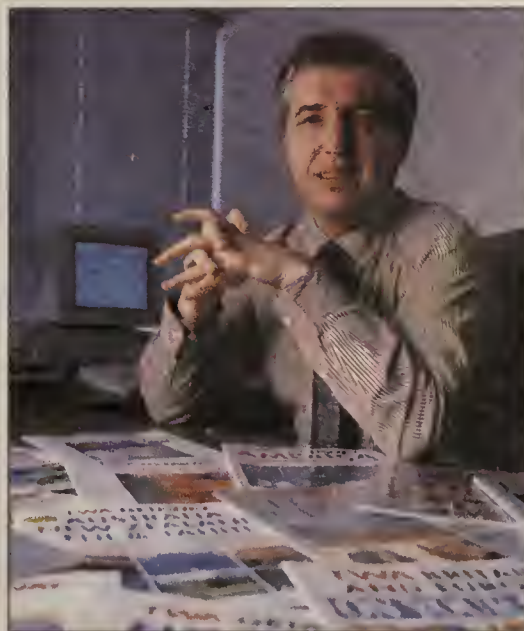
TWA Getaway has seen business jump 40% in the year since it installed a Digital Equipment Corp. VAX-based tour automation system linking data from an airline computer reservation system (CRS) to a complex database of hotel and entertainment options.

Can the Getaway vacation system really give travelers a custom vacation for \$300 to \$3,000 — the price of a packaged tour? "Try me," Corrodi says with a laugh. "In some cases, we can do better."

For example, TWA may offer a five-day Waikiki vacation package while a competitor

sells a seven-day package. Previously, TWA Getaway would have lost a customer who wanted a seven-day vacation, Corrodi says. But now, it can simply add two nights to its existing package and still do it at a competitive price.

To understand the difficulties TWA Getaway faced, it's helpful to



Alan S. Orling

**TWA Getaway's Pavlus welcomes cost-cutting innovations**

know how packaged tours are managed. Tour operators typically buy large blocks of hotel rooms, airline seats and entertainment tickets for specific dates in exchange for volume discounts from suppliers. They bundle those options into a package and sell the package for a fixed price.

The reason the packages are such a good deal is that the tour operators get price breaks through economies of scale. The reason travelers usually have limited options is that the operator has to make sure it fills up all those rooms at the same time.

TWA Getaway, a subsidiary of Trans World Airlines, runs a centralized tour booking service from its Mount Kisco, N.Y., offices. Most of its 225 employees are tour agents who deal with customers over the telephone and build vacation packages on the spot. The margins in the packaged tour industry are razor-thin, says company President Craig Pavlus. That's one reason tour packages have always been so inflexible.

TWA Getaway set out last year to create a system that "could mix and match all the components of a tour — airlines, hotels, surface transportation and entertainment options — on

*Continued on page 69*

# MONO



Traditional PC LAN

# VS. MULTI



PC LAN with AViiON Server

## Call 1-800-DATAGEN to learn how Data General and Novell NetWare let your PC LAN do more.

Data General has a host of Novell Portable NetWare® solutions that let your existing PC LAN run multiple applications simultaneously. Novell Portable NetWare on a Data General AViiON™ gives your PC LAN the power to share MS/DOS®, OS/2®, MAC/OS®, and UNIX® files. The power to cruise through MS/DOS, OS/2, and UNIX applications. And, the power to share peripherals.

Data General's NetWare for AViiON is the first RISC-based NetWare platform. It's fully scalable and can share the

server with major standards like TCP/IP. It also uses the standard NetWare client software and Novell's IPX/SPX Networking Protocol, so it interoperates with existing Novell LANs. It lets users access scores of applications. And, Data General offers a Software Developer's Kit to facilitate the development of client-server applications.

Data General's

line of Novell NetWare solutions brings transparent networking and distributed applications to all your PC clients.

To learn more about how an AViiON server with Novell's Portable NetWare can bring more power and more applications to your LAN, call the distributors listed below or 1-800-DATAGEN. Also, ask about Data General's full line of PCs.



**Data General**

3400 Computer Drive, Westboro, MA 01580

### DATA GENERAL'S NOVELL NETWORK DISTRIBUTORS

#### GATES/FA Distributing

121 Interstate Blvd.  
Greenville, SC 29616  
Sales: 800-332-2222  
Customer Support: 800-332-2299  
Technical Support: 800-332-2315  
Credit: 800-332-3497

#### Western Microtechnology, Inc.

National Sales Office: 800-634-2248

1637 North Brian Street  
Orange, CA 92667  
(714) 637-0200

14636 N.E. 95th Street  
Redmond, WA 98052  
(206) 881-6737

6837 Nancy Ridge Drive  
San Diego, CA 92121  
(619) 453-8430

12900 Saratoga Avenue  
Saratoga, CA 95070  
(408) 725-1660

28720 Roadside Drive  
Agoura Hills, CA 91301  
(818) 707-0377

1800 N.W. 169th Place  
Beaverton, OR 97006  
(503) 629-2082

20 Blanchard Road  
Burlington, MA 01803  
(617) 273-2800

2545 Tarpley Road  
Carrington, TX 75006  
(214) 416-0103

264 Passaic Avenue  
Fairfield, NJ 07006  
(201) 882-4999

Four Eves Drive  
Marlton, NJ 08053  
(609) 596-7775

story this page. The nontechnical challenges are said to be tougher — and can start early in the integration process, even before the system has arrived.

Managers may offer resistance to imaging systems simply because they are difficult to cost-justify in hard costs, says Jane Stanhope, senior industry analyst at Norwell, Mass.-based consulting and research firm BIS CAP International, Inc.

Cost is definitely an issue. Systems prices vary widely depending on the project, with some climbing to considerably more than \$1 million.

Despite the high price tags, imaging is hot in many industries, notes Wick Keating, vice-president of American Management Systems, Inc., a systems integrator in Arlington, Va. Insurance, banking, government and medicine are some.

Figures from the Association for Information and Image Management (AIIM), an industry group, suggest the boom will continue. In 1993, imaging revenues will reach \$6.8 billion, AIIM predicts.

### Imaging scrimmaging

But experienced integrators warn that as more executives look to imaging as a way to cut costs and boost efficiency, IS managers and executives must be aware of the not-so-obvious integration challenges. Among them are the following:

- **Cultural changes.** Strange as it sounds, Koopman says, managers need to realize that there are some workers who enjoy the paper shuffle and the interoffice and intercompany interactions it creates. Imaging can rob those employees of this particular kind of "job satisfaction."

The new environment means fewer errors, Koopman says, "but we're also taking away that warm feeling of being able to touch and see" your work load.

- **Elimination of jobs.** Job elimination is another concern, says S. Lamont McEvitt, vice-president of operations at systems integrator Dataimage, Inc. in Glastonbury, Conn.

One customer had 27 people in its microform department, he says. "After the system went in, the number dropped to five," because end users could look up files right from the desks. Those clerks didn't lose their jobs, but workers at other companies may not be so lucky.

- **Changing jobs.** Experienced users say that job changes can be felt at many levels of any company that brings in imaging. Many organizations have all paper documents scanned in right in the mail room, entirely changing the nature of the mail room and the jobs there.

- **Heavy dependence on the system.** After using it, some workers do not want to settle for anything less.

For example, at Gateway Bank's operation center in Newtown, Conn., an imaging system was put in place in 1987 that allows users to store bank records. "If you ask a clerk to go back and look at the old microfiche," says Martin Brennan, senior vice-president of operations, "they cry. People hate to go backwards."

- **Standardization.** When imaging gets its start in a user department, consultants say it can create problems down the road. Once other departments see the advantages of a system, they may decide to bring in systems of their own.

Eventually, that can lead to problems of who should be in charge of the systems and whether or not they should or could be linked, Keating says.

While technical problems are less troublesome than for some technologies, users caution that successful integration of imaging systems isn't exactly a plug-and-

## Integrating imaging involves:

**Organizational change.** Imaging changes the nature of jobs, from the mail room on up. This in turn sparks changes in company culture, as work flows and job responsibilities shift. Management needs to consider how employees will react to the new environment and new jobs.

**Money.** Imaging is not an inexpensive technology. Systems range in price from less than \$20,000 to more than \$1 million.

**Clear need.** Like all computing projects, imaging works only if it is truly the right solution. Simply having mounds of paper does not necessarily mean you need imaging.

**Long-range vision.** Nearly all vendors of imaging hardware and software see open systems on the horizon. Look for products that can be linked to existing systems or future plans.

**A measured approach.** Start slowly. Biting off more than you can chew is the quickest route to failure.

**Good vendor relationships.** A good vendor can help you smooth over political difficulties and be a great aid in systems integration.

**Good politics.** Control over an imaging project does not necessarily belong to the IS department. A clear company direction on who will control imaging projects can avoid confusion and misunderstanding early on.

ALAN J. RYAN



play affair, either.

For some, like PNC's Koopman, the technical aspect of integrating imaging was relatively simple. That's because there was no immediate need to integrate the system's optical disc with an existing IBM Personal Computer network.

"How much [integration] do you take on at once? Do I make sure I've got all the things integrated the day I start?" Koopman asks hypothetically. For him, the answer was no. "I want to bring the system in, automate my filing and retrieval. Once I've done that, then I want to be able to automate my work flow. I'll get onto the

bells and whistles later," he says.

The integration of a PC-based imaging system at the operations center of Gateway Banks was similarly smooth.

Brennan says when the bank wanted to update the expensive microfiche process in 1987, "We told the imaging vendor it would have to take the microfiche or off-load tapes from our Florida software, take it into the imaging system and then read it in there and store and index it. We didn't change our system at all."

The imaging company wrote software programs to allow for the conversion; the integration was seamless, Brennan says.

Today, Brennan says the imaging system is completely integrated into all aspects of the bank's records. "Anything we produce in the way of a report is put in the laser system."

Once systems are installed, retraining workers to use them is not too difficult or time-consuming, user companies say. To prove his point, Brennan says that a clerk unfamiliar with the imaging system was brought in and told to follow the instructions on the screen to find a particular file. It took her less than five minutes. "We then gave the same statement to an auditor and told him to find the statement in the microfiche — it took him 28 minutes."

In fact, users say that in most instances, imaging's benefits can easily outweigh all the potential headaches of integrating it.

"In the past, it was tough to get people to stay here more than three or four months," says Capt. Paul Titus of the records division at the New Orleans Police Department. Pulling police files and searching for paper documents was time-consuming and dull, and the work load was so large that it could never be completed.

Now, Titus says, civil service employees are actually looking to his department for employment opportunities.

In addition, he adds, the division took in \$750,000 by selling police reports produced on the imaging system to the general public, compared with about \$60,000 the previous year. To boot, he says, the department is saving nearly \$50,000 a year on microfilm paper and repairs. •

Ryan is a *Computerworld* senior writer.

## New breed of commercial integrators flocks to fast-growing imaging market

One sure indication that imaging is a hot technology is the booming interest in the area by commercial systems integrators.

Many firms — including big names such as Andersen Consulting and Electronic Data Systems Corp. — recently have begun offering imaging integration as part of a wide range of commercial services.

Unlike their predecessors in the imaging integration marketplace, who often built hardware and software systems, most of the new crop of integrators take a different approach, explains Jane Stanhope, a senior industry analyst at BIS CAP International in Norwell, Mass.

Stanhope says that today's imaging systems integrators "aren't playing the conventional role most people think of when they think of systems integration." Operating as middlemen, they help system buyers as well as vendors, who often lack the time or specific knowledge of the user's industry.

Put simply, these new middlemen create single imaging systems from vendor hardware and software, Stanhope says. They then provide applications development, project management and consulting help to the client and anything else that gets the system from the box to a production system.

The incentive is money. While it's difficult to find exact figures, industry analysts say it's clear that commercial vendors are onto what they consider a lucrative market. Sales of imaging systems are expected to quadruple to \$2 billion by 1993, according to BIS CAP.

Joe Carter, a partner and head of the imaging practice at Andersen Consulting, says imaging integrators have become more popular simply because there is so much integration to do.

"There are lots of vendors out there at this stage in the marketplace [whose products] don't readily talk to each other," Carter says. "But it isn't anything that should scare anybody away, because it can be done. It involves opening the hood and getting down into the internals to get the scanners and jukeboxes and software and workstations to work together," he says.

Carter adds that "You can't assume you can walk into your local computer store, buy all the parts and have it running together."

The demand for imaging integrators is also fueled by the need to bring imaging into a company's information processing environment rather than treat it as a stand-alone island of technology, Stanhope says. Many imaging integrators are now looking to nonproprietary systems that can be integrated, or turnkey systems.

According to Carter, however, even open systems will not eliminate the need for imaging integrators.

The need for integrators to develop applications rather than connect discrete pieces of imaging systems will grow. "As things become more shrink-wrapped," Carter says, "people will be able to easily get the basic infrastructure in place but will need the development of applications to go with it."

Some of the imaging integrators include American Management Systems, Arlington, Va.; Andersen Consulting, Chicago; Bell Atlantic Systems Integration Corp., Arlington, Va.; Boeing Computer Services, Seattle; Dataimage, Glastonbury, Conn.; Electronic Data Systems, Detroit; Ernst & Young, New York; Genesis Imaging Technologies, Valley Forge, Pa.; Grumman Infoconversion, Woodbury, N.Y.; Litton Integrated Automation, Alameda, Calif.; Scientific Applications International Corp., San Diego; and TRW Financial Services, Berkeley, Calif.

ALAN J. RYAN



YES, I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of \$38.95\* per year — a savings of 62% off the single copy price.

First Name	MI	Last Name
Title		Company
Address		
City	State	Zip

Address shown: ☐ Home ☐ Business ☐ New ☐ Renew Basic Rate: \$48 per year  
\*U.S. Only. Canada \$110, Central/South America \$130, Europe \$195, all other countries \$295. Foreign orders must be prepaid in U.S. dollars.  
Please complete the information to the right to qualify for this special rate.

COMPUTERWORLD

E4032-3



YES, I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of \$38.95\* per year — a savings of 62% off the single copy price.

First Name	MI	Last Name
Title		Company
Address		
City	State	Zip

Address shown: ☐ Home ☐ Business ☐ New ☐ Renew Basic Rate: \$48 per year  
\*U.S. Only. Canada \$110, Central/South America \$130, Europe \$195, all other countries \$295. Foreign orders must be prepaid in U.S. dollars.  
Please complete the information to the right to qualify for this special rate.

COMPUTERWORLD

E4032-3

1. BUSINESS/INDUSTRY (Circle one)
- 10. Manufacturer (other than computer)
  - 20. Finance/Insurance/Real Estate
  - 30. Medicine/Law/Education
  - 40. Wholesale/Retail/Trade
  - 50. Business Service (except DP)
  - 60. Government - State/Federal/Local
  - 65. Communications Systems/Public Utilities/Transportation
  - 70. Mining/Construction/Petroleum/Refining/Agric.
  - 80. Manufacturer of Computers, Computer-Related Systems or Peripherals
  - 85. System Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
  - 90. Computer/Peripheral Dealer/Distr./Retailer
  - 75. User: Other \_\_\_\_\_
  - 95. Vendor: Other \_\_\_\_\_
- (Please specify)
2. TITLE/FUNCTION (Circle one)
- IS/MIS/DP MANAGEMENT
- 19. Chief Information Officer/Vice President/Asst. VP IS/MIS/DP Management
  - 21. Dir./Mgr. MIS Services, Information Center
  - 22. Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm. Network Sys. Mgt.; Dir./Mgr. PC Resources
  - 23. Dir./Mgr. Sys. Development, Sys. Architecture
  - 31. Mgrs., Suprv. of Programming, Software Dev.
  - 32. Programmers, Software Developers
  - 60. Sys. Integrators/VARs/Consulting Mgt.
- OTHER COMPANY MANAGEMENT
- 11. President, Owner/Partner, General Mgr.
  - 12. Vice President, Asst. VP
  - 13. Treasurer, Controller, Financial Officer
  - 41. Engineering, Scientific, R&D, Tech. Mgt.
  - 51. Sales & Mktg. Management
- OTHER PROFESSIONALS
- 70. Medical, Legal, Accounting Mgt.
  - 80. Educator, Journalists, Librarians, Students
  - 90. Others \_\_\_\_\_
- (Please specify)

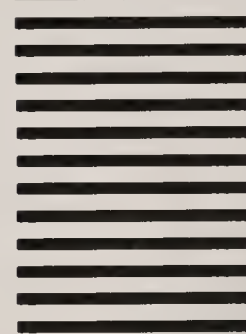
3. COMPUTER INVOLVEMENT (Circle all that apply)
- Types of equipment with which you are personally involved either as a user, vendor, or consultant.
- A. Mainframes/Superminis
  - B. Minicomputers/Small Business Computers
  - C. Microcomputers/Desktops
  - D. Communications Systems
  - E. Local Area Networks
  - F. No Computer Involvement

1. BUSINESS/INDUSTRY (Circle one)
- 10. Manufacturer (other than computer)
  - 20. Finance/Insurance/Real Estate
  - 30. Medicine/Law/Education
  - 40. Wholesale/Retail/Trade
  - 50. Business Service (except DP)
  - 60. Government - State/Federal/Local
  - 65. Communications Systems/Public Utilities/Transportation
  - 70. Mining/Construction/Petroleum/Refining/Agric.
  - 80. Manufacturer of Computers, Computer-Related Systems or Peripherals
  - 85. System Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
  - 90. Computer/Peripheral Dealer/Distr./Retailer
  - 75. User: Other \_\_\_\_\_
  - 95. Vendor: Other \_\_\_\_\_
- (Please specify)
2. TITLE/FUNCTION (Circle one)
- IS/MIS/DP MANAGEMENT
- 19. Chief Information Officer/Vice President/Asst. VP IS/MIS/DP Management
  - 21. Dir./Mgr. MIS Services, Information Center
  - 22. Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm. Network Sys. Mgt.; Dir./Mgr. PC Resources
  - 23. Dir./Mgr. Sys. Development, Sys. Architecture
  - 31. Mgrs., Suprv. of Programming, Software Dev.
  - 32. Programmers, Software Developers
  - 60. Sys. Integrators/VARs/Consulting Mgt.
- OTHER COMPANY MANAGEMENT
- 11. President, Owner/Partner, General Mgr.
  - 12. Vice President, Asst. VP
  - 13. Treasurer, Controller, Financial Officer
  - 41. Engineering, Scientific, R&D, Tech. Mgt.
  - 51. Sales & Mktg. Management
- OTHER PROFESSIONALS
- 70. Medical, Legal, Accounting Mgt.
  - 80. Educator, Journalists, Librarians, Students
  - 90. Others \_\_\_\_\_
- (Please specify)

3. COMPUTER INVOLVEMENT (Circle all that apply)
- Types of equipment with which you are personally involved either as a user, vendor, or consultant.
- A. Mainframes/Superminis
  - B. Minicomputers/Small Business Computers
  - C. Microcomputers/Desktops
  - D. Communications Systems
  - E. Local Area Networks
  - F. No Computer Involvement



NO POSTAGE  
NECESSARY  
IF MAILED  
IN THE  
UNITED STATES



**BUSINESS REPLY MAIL**  
FIRST CLASS PERMIT NO. 55 MARION, OH 43306

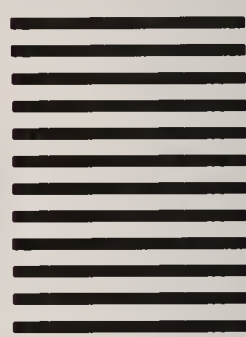
POSTAGE WILL BE PAID BY ADDRESSEE

**COMPUTERWORLD**

P.O. Box 2044  
Marion, Ohio 43306-2144



NO POSTAGE  
NECESSARY  
IF MAILED  
IN THE  
UNITED STATES



**BUSINESS REPLY MAIL**  
FIRST CLASS PERMIT NO. 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

**COMPUTERWORLD**

P.O. Box 2044  
Marion, Ohio 43306-2144



in-  
ut-  
ce-  
  
ple  
our  
re-  
ice  
and  
me-  
oad  
om-  
  
oy-  
ent  
  
ook  
pro-  
gen-  
000  
the  
0 a

## EXCLUSIVE COMPUTERWORLD SURVEY

# Integration priorities

A whopping 81% of you peg network security as the integration issue most on your minds, according to a recent *Computerworld* survey of 194 IS chiefs. PC-to-mainframe connections trail closely at 76%.

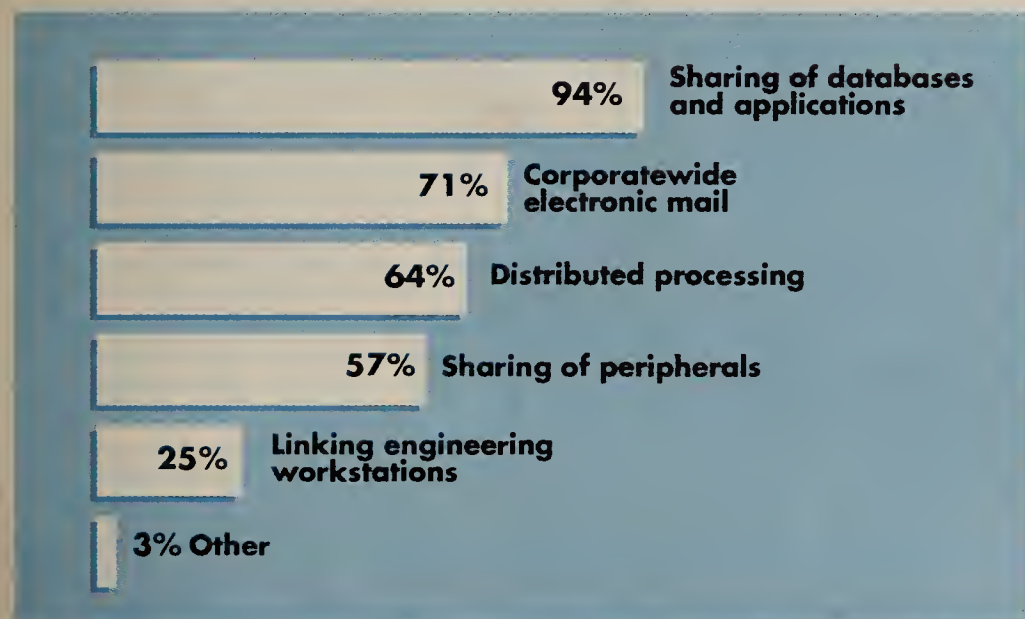
No wonder. Having a virus, dishonest employee or outside perpetrator fiddling with your network has enterprisewide repercussions these days — more people are getting more access to more data. And that data sharing will become more widespread, according to your responses. You say your integration to-do list includes access to corporate resources as well as linking users and departments.

Once you've brought disparate parts of the organization together, 94% of you say you'll be able to achieve database and applications sharing, electronic mail (71%) and distributed processing (64%).

Ambitious plans, for sure. Here's hoping the Bombastic Bombay virus doesn't hit just when you think you've got it all together.

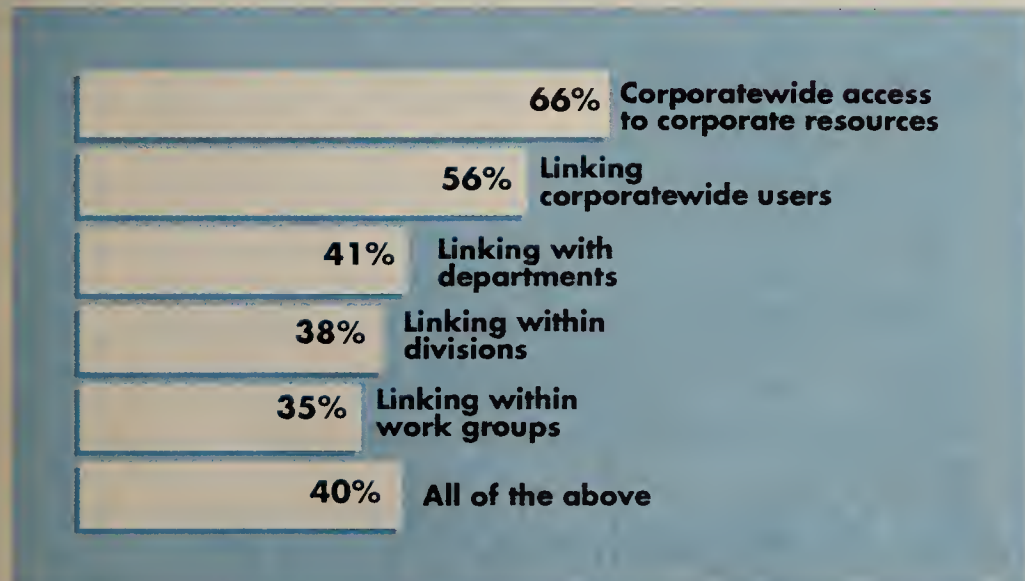
## "What types of applications will be made possible by your integration strategy?"

Percent of respondents, base of 190, multiple responses allowed



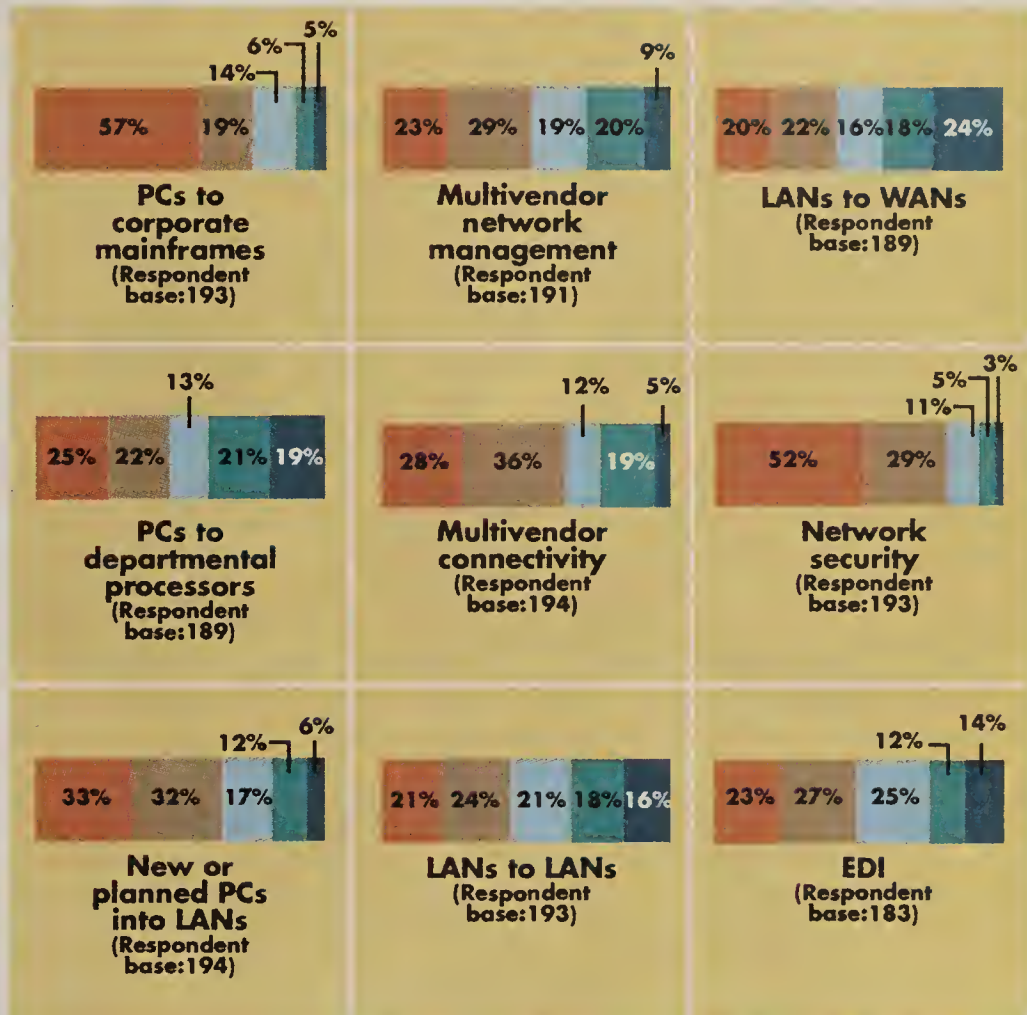
## "What are the most important aims of your IS integration strategy?"

Percent of respondents, base of 192, multiple responses allowed



"How important are each of the following communications-related integration issues to your organization?"

### KEY



## In other words . . .

"We have been connecting LANs into a wide-area network. We have about 18 to 20 LANs already connected. While doing this has allowed more data to move electronically with more speed and accuracy, it's expensive. And security has become an issue as modems enable people from the outside to have access internally. To combat any security breaches, we recommend a callback procedure."

**Jim Appleyard**  
Manager of Information Security Services  
Duke Power Co.  
Charlotte, N.C.

"We are working on tying an Apple network into a DEC VAX network. Security will be an issue in this kind of setup, as will how fast we can get information to the end user."

**Walter Perkowski**  
First Vice-President of Computer Operations  
Republic National Bank of New York  
New York

"We plan to standardize everything into a DEC network on which will run manufacturing, engineering, financial and word processing applications. This setup will give us worldwide integration, saving us money and increasing our competitive edge."

**Diane Coleman**  
Director of MIS  
Fleetguard, Inc.  
Nashville



*Due to a software error at the credit card company,  
the power lunch is now in hot water*

Software problems can be embarrassing. Fortunately, tools to build better software are now available from IBM and its business partners. KnowledgeWare is the industry leader in Computer Aided Software Engineering (CASE) tools and technologies. And our close relationship with IBM makes us the natural choice of IBM users.

For more information on KnowledgeWare CASE tools, call 1-800-338-4130. KnowledgeWare, Inc., 3340 Peachtree Road N.E., Atlanta, GA 30326.



**KnowledgeWare®**

*The World's Most Comprehensive CASE Tool Set™*



a real-time basis and bring back a single price for the customer within six minutes," Pavlus says. The company also wanted to do it within four months in order to hit the Sept. 1 start of the winter vacation season.

Pavlus and Corrodi listened to a pitch from a Digital Equipment Corp. salesman, liked his message about portability and communications and contracted the whole project out to DEC and Autofile Software Ltd., a British provider of customized software for the travel industry. DEC and Autofile met the four-month deadline, and the \$4 million package they put together has changed TWA Getaway's way of doing business.

Foremost among the innovations is what Corrodi calls a "floating hotel inventory." Now, instead of selling hotel rooms in large fixed blocks, the tour operator allocates them flexibly as requested by the customer. "It's like the difference between keeping an inventory of watches and keeping an inventory of watch parts which you use to make custom watches," Corrodi says. "Before, we had to tell customers, 'Sorry, it's these nights or not at all,'" he says.

The other innovative aspect of the TWA Getaway system is its link to TWA's Pars CRS. While CRSs have revolutionized the travel industry, they aren't renowned for their user-friendliness. Most simply present users with screens of data accessible only through arcane commands. In fact, Pavlus says, the way tour

agents usually capture information from a CRS screen is to write it down by hand.

Autofile developed a computerized interface to the Pars CRS that, in effect, mimics a human operator. Now, instead of confronting an on-line CRS screen, the agent fills in menus detailing things such as how many people are traveling, when they want to fly between what cities and at what prices.

The agent then moves on to other things while the software hums away in the background assembling the necessary information from the CRS.

"We're at the point that the sales agent does not need to know a single airline system command," Corrodi says.

Adds Pavlus: "It's cut our agent training time from eight to four weeks. No oth-

er project has achieved this level of application integration with an airline CRS."

A recent upgrade to the TWA Getaway system extends the Pars interface to automatically book reservations and update the traveler's itinerary when flight schedules change. Previously, schedule changes had to be entered into the customer record by hand, Pavlus says.

The TWA Getaway system has several other cost-cutting innovations. Back-office automation enables tour agents to generate boarding passes, hotel confirmation slips and entertainment tickets on the spot and mail them in a single overnight package. TWA Getaway sends as many as 800 Federal Express packages per day to customers.

Still, the Getaway system is far from

perfect, Corrodi says. Communications with hotels are still awkward, involving a tangle of facsimiles, telexes and telephone calls to reserve blocks of room and send periodic reports. Corrodi would like to see the whole process automated via electronic data interchange but says the travel industry is still far from agreeing on formats that are acceptable to everybody.

The system's CRS interface is also limited to TWA's Pars, which is a small player in the airline reservation market. Pavlus says his company is close to concluding an agreement with Worldspan, a joint CRS venture of TWA, Northwest Airlines and Delta Airlines, to extend the interface to that system. •

Gilllin is *Computerworld's* executive editor.

## No place like home

While TWA Getaway sometimes has as many as 600 concurrent on-line terminal sessions running simultaneously, the company doesn't have a host computer on-site. The DEC VAX 8550 cluster that supports its tour package system is 1,000 miles away in Kansas City, Mo., which is where parent company TWA's Pars reservation system is based.

The site choice was made for network reliability reasons and because the Kansas City center already had computer room facilities in place, says Brad Corrodi, director of MIS. The VAX links to TWA's Pars system through a combination of Decport software and Simpact, Inc. hardware, also giving programmers a set of tools they can use to write applications around the Pars airline database.

Tour agents connect with the system over a wide-area Ethernet network. TWA Getaway uses Vitalink network bridges linking backbone networks to its Mount Kisco, N.Y., headquarters, Marleton, N.J., reservations center and Kansas City data center over two 56K bit/sec. communications lines with two 56K bit/sec. lines for backup. Tour agents work on Falco 5220 terminals, which let them switch back and forth between two full-screen sessions. The terminals are linked to Decserver 500 series terminal servers.

PAUL GILLIN



## It's an art selecting the ones that best fit.

They're all strong players on our team. . . and they're ready to join yours.

From our long leadership in telecommunications, it was a natural next step to data communications and office systems. . . and we represent the leading component and systems manufacturers in both areas. Which gives you the best selection of the most advanced technology. . . the knowledge that you're getting a customized solution to your

problems. . . and the assurance that you're getting equipment and service that you can rely on.

We take what you've got and add what you need to create the hybrid network that will best serve you. We integrate your infrastructure, computing platforms, mediums, protocols, LANS and WANS. GTE provides the consulting skills, design methodology, and design integration capability

with proven project management experience. Plus the talents of a sophisticated staff to furnish maintenance, service and training on site.

All of which makes it possible for your people to do what they do best. . . run your business at maximum efficiency. After all, selecting the right players could well turn out to be the key to your winning or losing the big one.



THE POWER IS ON

FOR MORE INFORMATION CALL:

1-800-828-7280 OUTSIDE OF NY STATE  
1-800-462-1075 NY STATE ONLY

# Keeping up with Jones

*Regional freight hauler uses integrated freight tracking system to outmaneuver the competition*



BY LORY ZOTTOLA  
CW STAFF

**J**ones Truck Lines, Inc., which bills itself as the "No wait, hate to be late, first-rate freight company," takes its customers very seriously — and with good reason. When results of Jones' annual customer satisfaction survey come in, the company's 3,400 employees hold their breaths. Incentive bonuses at the \$250 million freight hauling company — from top management on down — are tied to that review. What the customer has to say means something here.

Besides criteria such as service, on-time performance, condition of freight and accuracy of the freight bill, Jones asks customers to rate the company's technical capabilities. That's the part that Mick Crowder, vice-president of administration, has watched very closely during his four-year tenure at the Springdale, Ark.-based firm. And he's happy with what he sees. Customer satisfaction with Jones' information systems operations has gone from a grade of B to B+/A since the firm implemented a \$9 million integrated database and freight hauling application in 1988.

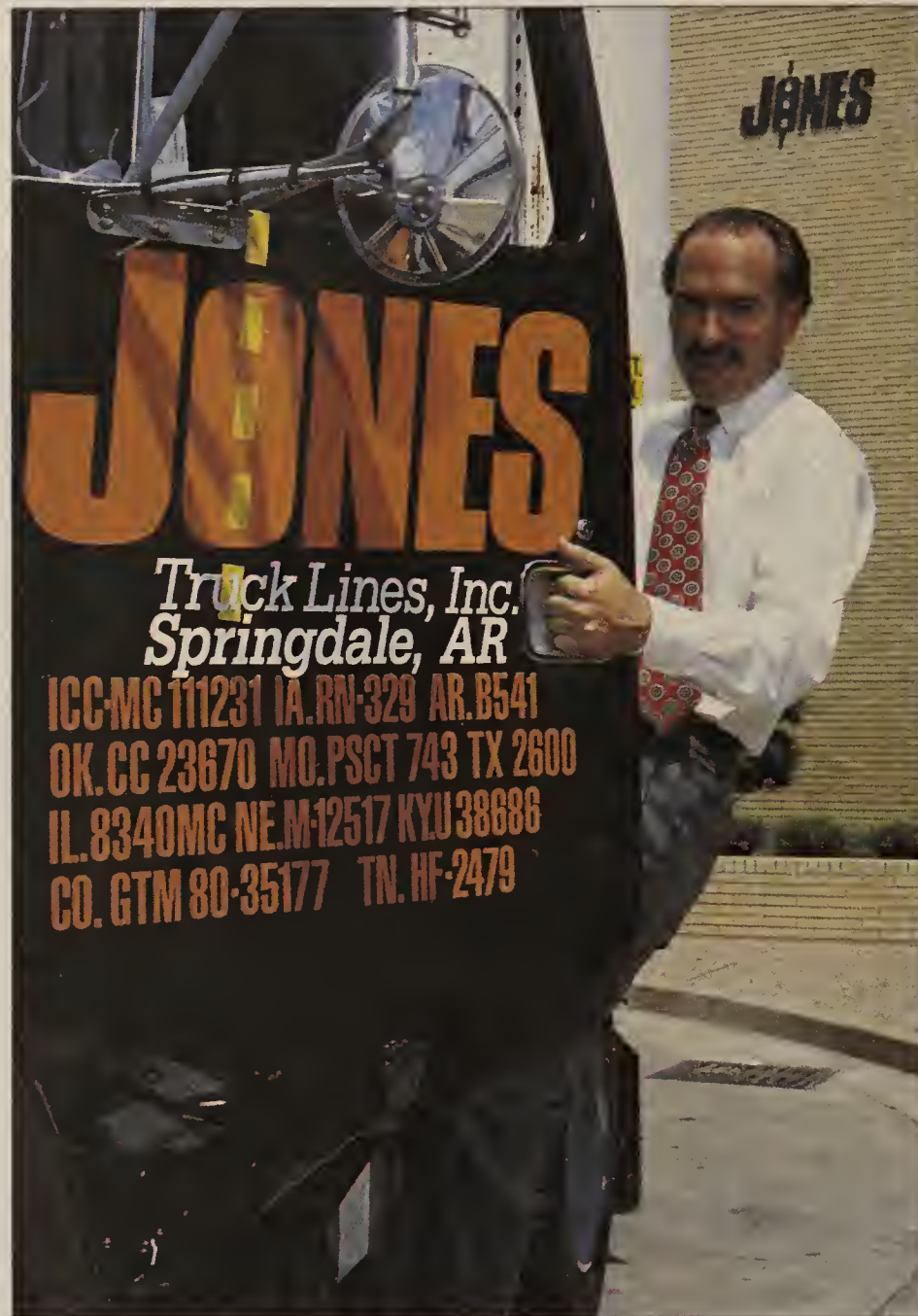
The system lets 90 of the company's 125 freight terminal locations identify and trace freight, as well as make on-line inquiries about its status, via AT&T leased lines.

Moreover, 200 of Jones' freight customers can dial into the menu-driven system using their personal computers and modems to get up-to-date tracking, billing data and freight terminal information residing on the mainframe 24 hours a day, seven days a week. They can also use such electronic data interchange capabilities as electronic invoicing.

## Rough terrain at times

But it hasn't been all smooth riding for the 72-year-old carrier. Jones competes in what is known as the less-than-truckload (LTL) market, a segment made up of haulers that move freight weighing less than 10,000 pounds from multiple shippers to multiple consignees.

During the deregulation of the 1980s, competition became fierce in



Robert R. Mercer/Gamma Liaison

**Jones' system performance earns high marks, Crowder says**

the \$16 billion per year LTL arena. For Jones, the pressure of being a regional company in a deregulated trucking environment was made even worse by the company's outdated information systems.

After deregulation, many freight haulers, including Jones, began offering individual customer discounts on industry tariffs as a way to be more competitive. While discounts helped business, they also greatly complicated the manual billing process. Frequently, it was tough to identify the customer and to determine quickly the proper rate at which to bill them, according to Crowder.

The whole system, he says, "left a lot of room for error." This was especially bad news because Jones was in the midst of a regional cat fight that already had put two competitors out of business.

Watching the shakeout, Jones' management "was alternately yelling, screaming, begging and weeping" for vital customer information, explains Chris Steward, project manager during the year-long system overhaul at Jones.

With the sanction of his boss, Jones President Elliott Burnside, Crowder and a seven-member technical team set out to put Jones' house in order.

The first big move was to scrap an old DL/1 database system running on an IBM 4381 mainframe in a DOS/VSE environment. In its place came a Software AG Adabas database and Natural2 fourth-generation language, running on an IBM 3090 under MVS/XA. The database holds information on customers, freight and rates.

The new system — dubbed the Fast, Accurate and Certain Transportation System (FACTS) — went on-line in April 1988.

Today, the FACTS database handles 350,000 to 400,000 on-line transactions daily from its freight terminal locations and customers, according to Jon Sutton, Jones' manager of database administration.

The system helps answer common customer questions concerning freight location and delivery time for the 200,000 shipments typically handled by Jones in a month. As freight

moves across Jones' 23-state route, information is entered by staff at the freight terminals and updated in real time along the way.

Another benefit, says Tom Morehouse, vice-president of marketing, is that customers can now make special information requests using FACTS. For example, a customer can now obtain any combination of data on shipment, weight, charges, pieces, service time, inbound/outbound transit times and statistical information within a day or two, compared with the several weeks previously needed.

Jones says that internal business management can also get the same kind of custom data and no longer needs to beg and weep for crucial information.

Morehouse explains: "A sales manager can go to a new client with a special report and say, 'Here's the data on your first 15 shipments. They were all rated accurately, the transit times are up to snuff.' It's a very powerful marketing tool that reinforces the client's decision to use our services."

## Rather switch than fight

By switching to a modern integrated database system, Jones says it has realized labor savings. In the past, rate clerks could take up to five minutes to establish a rate. Today, the same information is delivered on-line in nanoseconds and is 99% error-free, Crowder says.

But FACTS doesn't stop there; 50 of Jones' large customer accounts use the company's transportation industry-standard EDI connection to receive rate and shipping information, Crowder says. These users exchange information directly or through a third-party mailbox.

Early each morning, five days a week, EDI customers receive customized shipping and freight status reports, delivery schedules and an electronic invoice for billing of freight charges. Customers can also make payments to Jones' bank account via a third-party clearinghouse.

While the road appears smooth for Jones right now, managers say that the company can't afford to become complacent. Nonunion competition from two of the top three national trucking companies, Roadway and Consolidated Freightways, is bearing down on Jones' regional business, says Al Konrad, president of Traffic Consultants, Inc., a freight movement consulting company in Memphis. Konrad says that Jones needs to keep its customer base content by pushing such business staples as EDI. •

*Project Manager Christopher Steward gives an insider's view of the Jones project. See column, facing page.*

Zottola is *Computerworld's* managing editor, special projects.

# HANDS ON

Christopher Steward

## Integration: Just do it



When I came into Jones Truck Lines as project manager for its database integration project, the company's survival was being threatened by a patchwork of outdated information systems built on a foundation of outdated technology. Jones needed to completely replace its outdated and inflexible systems with something sleeker and more modern.

From our work on the Fast, Accurate and Certain Transportation System (FACTS) project, we derived the following suggestions for systems integration projects:

**Just do it.** From the beginning, problems, issues, egos, politics and other killers that reduce projects to a crawl — if not a dead halt — were discussed, decided on, dealt with, acted on or dismissed. Nothing was permitted to stand in the way of the project's success. The message was quite clear to all participants: Just do it.

**Get commitment at the highest levels.** At Jones, senior and executive management considered the FACTS project to be the No. 1 priority in the company and for one simple reason: The very future of the organization was depending upon its success. Without this kind of support, the project team might abandon its "just do it philosophy" for its close cousin: "Just have nothing to do with it."

At Jones, a commitment was made from President Elliot Burnside on down. A direct report to Elliot, then vice-president of information systems Mick Crowder was designated as the executive manager with ultimate responsibility for making the project happen. As a result, when called on, managers at all levels always made themselves available for meetings and decision-making.

**Don't fix, build anew.** If you want a Ferrari, you wouldn't start with a Volkswagen Beetle and try and fix it up.

Integrated systems are constructed from the ground up on the principle of data sharing.

**Choose the right people.** All the methods, tools, commitment and philosophies in the world won't help you unless you have the people to just do it.

Jones did everything right in this area:

- It hired expertise in the new technology. Instead of trying to build the new system entirely by itself, Jones looked for some help from the outside. It put together an outstanding team of people.
- It didn't use the same people who built the old system. Too many large-scale systems development efforts fail because the same people who built the old system are the same ones picked to build the new one, with the reasoning that "they know the business."

It's hardly surprising that in the end, the system is basically the same as the one that went before. The only difference is

that it is constructed with inappropriate use of the new technology, which compounds the problems experienced with the old system.

- It created a team atmosphere. Jones had its own systems development team members, assigned full-time user representatives and took on the mammoth tasks of data conversion, user training and hardware and systems software replacement.

This meant that the ultimate success of the project was also dependent on Jones staff — it wasn't simply dumped in the lap of the hired help.

This approach had another huge benefit: Once the system was built, Jones supported it on its own with its trained users and trained IS staff.

- It went lean and mean. The trainee army approach to systems development just doesn't cut it. I'll take six smart, experienced people with something to prove any day of the week.

**Have a method.** Data sharing is vital to the development of stable, integrated information systems capable of providing timely and accurate information at all levels, operational through executive management.

Some years ago, Detroit came to the conclusion that you can put the same engine in different car bodies and provide different car models without undergoing the expense of custom designing a new engine every time.

The same holds true with data. If you design a good data engine — a database

— it can support many different uses without having to custom design a database every time.

**Make sure you have the right tools.** If you want to build a system quickly, you use a modern, fourth-generation language, not Cobol.

Also, don't buy a product line in which the individual products are not designed to work together.

**There is no magic to this process.** Once you realize that, you're in good shape.

Steward is currently director and co-founder of Candec Data Solutions, Inc., a New York-based company specializing in data consulting services. He served as project manager during Jones' integration effort.



If you work for the same organization, you should work on the same network.

Even if your organization is scattered over a dozen different networks and sites, you can still share projects and ideas as in the good old days. But instead of working under one roof, you work together on one network—from Network Systems.

We make a family of high-performance routers that treat all networks as equals. You can connect almost everything from Ethernet® to FDDI to WANs. From PCs to mainframes to supercomputers. From this side of the building to the other side of the world.

That means you can pick systems and networks that fit the need without wondering if all the pieces fit together.

Call 1-800-338-0122. Network Systems routers make everyone in your organization as close as right across the hall.

 **Network Systems.**



# You Asked. We Listed. Smaller, Faster, More



Introducing dBASE IV®  
version 1.1.

Smaller because the new Dynamic Memory Management System (dMMS)™ reduces memory requirements from 516K to 450K. So you can run larger applications.

Faster because the same dMMS reduces dBASE IV's need to access your hard disk. On top of that, the new built-in Disk Caching Option uses extended or expanded

memory to further improve disk performance.

More reliable too. Thanks to one of the largest pre-release (beta) testing programs ever conducted for a PC database.

## Tested By Some Very Independent People.

dBASE IV version 1.1 was found to be more reliable in tests conducted by over 2700 independent developers, users and MIS departments. All

together, they used over 1000 different single and multi-user system configurations.

The result of all this is a smaller, faster, more reliable dBASE IV. With a simpler installation to get you up and running quicker.

Which means you can now start working faster and more efficiently than you ever have before.

Especially since you can operate dBASE IV through

# ned. Introducing A e Reliable dBASE IV.

the powerful Control Center interface.

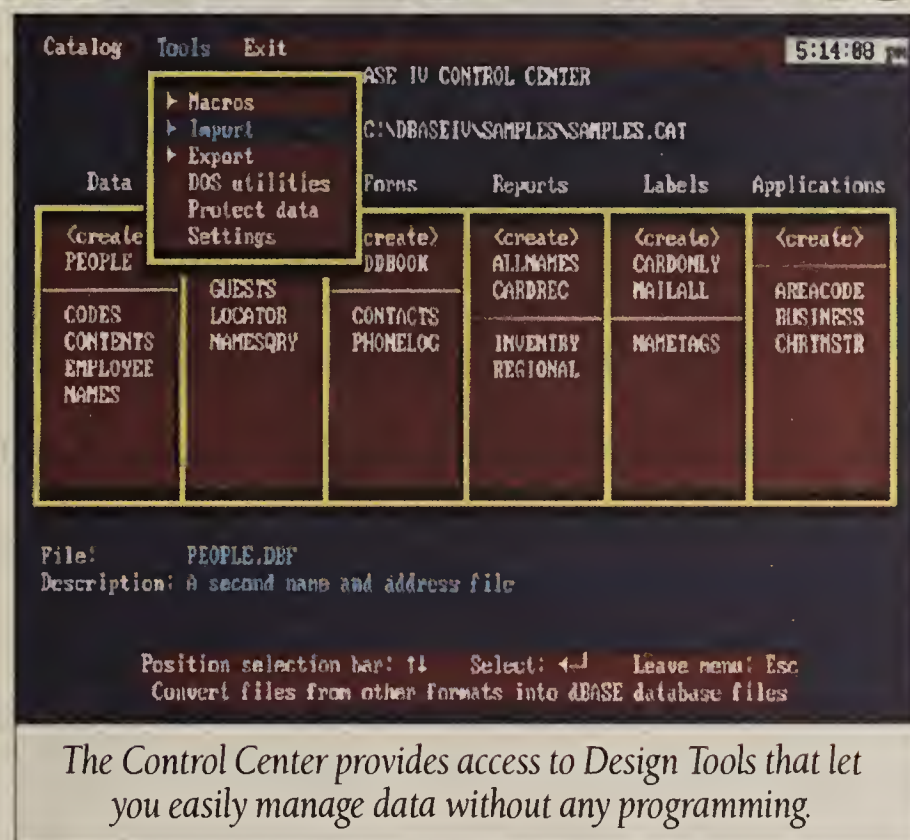
## Now Anyone Can Use dBASE IV.

The Control Center is powerful because it's so simple. It's like a window to your data that you work with intuitively.

It gives you access to What-You-See-Is-What-You-Get (WYSIWYG) Design Tools that work through simple pull-down menus. The tools let you easily create custom forms, reports, labels and databases—without programming a single line of code. In addition, there's Query By Example (QBE) for quick answers without any programming—even if all your data is spread across multiple databases.

The Design Tools ensure that first time users will be up and running quickly, and that experienced users will realize high productivity gains.

In fact, even beginners can develop complete applications



automatically by letting our Applications Generator easily tie together everything they've created with the tools.

## New Developments For Developers.

If you're a developer, you'll appreciate the new language enhancements and more flexible User Defined Functions (UDFs). Plus the Automatic Code Generator, which produces structured dBASE® code for any object you create with the Control Center's Design Tools. In addition, there's the built-in Debugger/Editor for streamlining the program debugging process. If you buy

the Developer's Edition, you'll also enjoy exclusive features like the Template Language—which lets you control the way dBASE IV generates code. And the RunTime Module for free, unlimited distribution of your applications.

## Call Us Today. We'll Listen Closely.

But no matter who you are, you'll appreciate our new support policy.

Free, unlimited telephone support. (Your only charge is your toll call.) So see your Ashton-Tate® dealer today. Or call 1-800-437-4329 ext. 1403 for more information. Better yet, dBASE III PLUS® users can call 1-800-2-ASHTON for an immediate upgrade. Registered dBASE IV version 1.0 users will get a free upgrade.

Call now and tell us what we can do for you.

You can rest assured, we'll be listening.

 Ashton-Tate®



**In order to beat your competition, check out our powerful new additions.**

Find out what these new broadband networking systems can do for your enterprise's productivity, efficiency, profitability and competitive edge.

Timeplex offers powerful new FDDI-based routers and concentrators and T-3 networking systems that offer tremendous advantages in bandwidth capacity, connectivity, privacy and price/performance.

TIME/LAN™ 100 FDDI Routers allow both local and wide area internetworking while providing high security, high performance local and remote TCP/IP routing.

TIME/LAN FDDI Concentrator+ allows the attachment of up to 8 workstations to an FDDI LAN cutting the connection costs by up to 50%.

TX3/SuperHub™ is the industry's highest capacity commercial T-3 networking system. It terminates up to 10 T-3s, adheres to public T-3 and T-1 standards and is designed to migrate to SONET.

Our competitors said these capabilities were years away. They're only one telephone call away.

Call Timeplex at 1 (800) 669-2298.

When it comes to broadband connectivity, no one can even come close to Timeplex.

**Timeplex®**

The Connectivity Leader

TIMEPLEX CORPORATE HEADQUARTERS: 400 CHESTNUT RIDGE RD., WOODCLIFF LAKE, NJ 07675 1 (800) 669-2298

<small>Canada (416) 886-6100</small>	<small>United Kingdom (447) 534-3559</small>	<small>France (331) 3064-8100</small>	<small>Europe (322) 762-1696</small>	<small>Australia (612) 957-1660</small>	<small>New Zealand (644) 711-287</small>	<small>Far East (852) 833-6848</small>	<small>Middle East/Africa (322) 762-1696</small>	<small>Latin America (201) 930-4666</small>
--	--	---	--	---	--	--	--	---

## INTERVIEW

# DEC's big integration umbrella

*Integration chief Russell Gullotti says a global reach and top-notch partners will help DEC weather an industry shakeout*

**I**n early 1989, Digital Equipment Corp. formalized its systems integration effort, creating the Enterprise Integration Services group. The move united 18,000 DEC employees who had been doing systems integration in one form or another for years and put them under an umbrella organization. Russell Gullotti, vice-president of the EIS group, says that DEC's annual systems integration revenue now exceeds \$1 billion. Gullotti recently spoke with Computerworld Features Editor Glenn Rifkin.

## How do you respond to people who contend that computer vendors, acting as systems integrators, push their own hardware and software?

There are those customers who say, "You can never be objective. I wouldn't expect you to be objective. Therefore, you will never be my management consulting arm." There are customers at the other end of the spectrum. They say, "Don't talk to me about bias, everyone is biased, no matter who they are. They are trained in some set of hardware and software and they are always going to recommend those, so you are no worse than any of the others. What I want is my problem solved, and if you have to sell me your hardware to do it, go ahead."

I contend that nobody in this business is neutral. Everyone has a preference going in about how something ought to be solved.

## How much do you involve end users in a project?

There are those systems integration efforts that are mission-critical. In those instances, I don't want my people to go ahead and do that work unless we have a senior Digital person — a vice-presidential level person is required sometimes — to close the door with the equivalent-level person in that company, one-on-one, and say, "Do you know what you are getting into? Do you understand we will have some bumps in the road ahead? Do you understand the mission-criticality? Are you committed to it for the long haul? Are there internal wars going on that will prevent success? Are you committed to prevent that from happening?"

When given clear, crisp responses, we go. When there's a lot of equivocation or we sense a lot of internal politics and fighting that would prevent success, I caution my folks not

to do that work.

## You turn work down?

Yes. We've said to the customer, "We can't go ahead the way things are. You don't have a person who is responsible for this effort inside your company. You have multiple organizations that think they are running it. Therefore, it can't succeed. Or you don't know yet what you want to do. Let's work with you on a planning stage to pin it down." If they can't, we shouldn't do it, because we're not going to deliver what they want.

## Do you run into internal IS staff who resent your presence?

Yes, we do. The first thing we have

## What is an alliance partner?

We sit with Andersen or Deloitte or CSC and say, "We don't have this particular set of skills, and you are very good at it. Can we come to some agreement whereby we can train some of our people in your capabilities, and when we call, you'll respond in this time frame?"

With these agreements in place, we can now make the phone call from our local district and cause activity to begin immediately, because we've eliminated the month-long mating dance we used to go through. If this works perfectly, we can be responding to a request for proposal within a week.

## What happens in the case of



Stella Johnson

to do is to make sure that if that happens, it will not stop the effort from succeeding. Frankly, we'll find a way to bring IS into it. They're crucial to success, and we want their support. I look for a single point of contact.

## Is that contact usually IS?

Often it's IS — probably half the time. Our job is not to go around the people responsible for this stuff; our job is to work with them as often as we can.

## Whom do you most often encounter in competitive situations? IBM?

Yes, IBM for sure. They have positioned themselves to be able to solve these problems, and because they are who they are, we see them a lot. We also see Arthur Andersen, Deloitte, CSC — those three are alliance partners with Digital.

## a project such as Eastman Kodak, in which you work with IBM? What do you do when you run into a problem and it's not clear which vendor's equipment is at fault?

If that were to occur, both parties would just sit down and figure out what the problem is technologically. It's either in the data center or it's on the network. We'd do what needs to be done to fix it.

## Everybody out there is now calling himself a systems integrator. What distinguishes DEC?

The word systems integration is so imperfect and ill-defined that everyone has their own twist on it. We're really a full-service systems integrator. We can provide the consulting, supply the design and the implementation, maintain it and do the facili-

ties management all ourselves, in multiple industries, across oceans on a global basis with a wide breadth of resources. There aren't many who can make that claim.

There are niche systems integrators who, if they were ever faced with a \$50 million integration effort spanning multiple countries, could not do it. Are they systems integrators in their niche? Sure. Will they compete with the DEC's of the world? No. It is systems integration at a different level, and there's plenty of room for them to do their work.

## How fast are you growing each year?

The market is growing in excess of 20% a year. We're growing faster — over 25% in the past year. I'm a little worried that the growth is so high. I hope I can staff up and get the skills in place quickly enough.

## DEC has a lot of people internally in transition, basically moving out of jobs that no longer exist. Is your group a place where people are trying to go?

Yes. We have "pitchers" in our company — people who have employees whose work has gone away. We also have "catchers." I'm a catcher, and I have a great big mitt. The piece of the company that I manage is growing, and I am getting the cream of the crop. Our strategy is "send me the best, and then backfill from within your own organizations."

## Is money a big issue, or are your customers so big that it is not a factor?

By the definition of systems integration we use, I can have lots of \$50,000 efforts going on. So projects are not all big and mission-critical, but they are all important. A \$50,000 integration effort that may be used to port a piece of application software to another piece of equipment can cause a lot of problems in the company. When I talk systems integration, most people immediately think big. I don't. I think complicated, risk-sharing, global.

## Is there an average-size job?

I'd say that the average size is slightly over \$5 million. The folks in my group say it's closer to \$10 million.

## The future?

In five years, people may not even use the words systems integration. That's where I'm taking it. •

# The integrated desktop: Hit or myth?

*Users say that blending Unix and OS/2 is helpful,  
but easier said than done*

## INTEGRATING THE DESKTOP

BY AMIEL KORDEL  
and MICHAEL FITZGERALD  
CW STAFF

**I**nformation systems integration can sometimes seem like a chimera, and perhaps nowhere more than in personal computing.

While long promised by the computer industry, tying together PCs and workstations running disparate operating systems has remained difficult and uncommon. Few users have seamlessly linked Apple Computer, Inc. Macintoshes, Unix boxes or OS/2-based workstations to PCs running DOS.

The snail pace of desktop integration is mostly because of low user demands, says Mary Chin, a PC analyst at Dataquest, Inc. "It is simply based on the fact that there isn't that much out there besides DOS. OS/2 has not happened, and the market for connecting DOS and Macintosh is just starting to emerge," she said.

Users wishing to integrate desktop operating systems are dogged by technical problems and a lack of software tools. Integration is usually limited to data sharing or DOS emulation on Unix. Even then, users often must have the same package on both sides of the technical fence, such as Mac and DOS versions of Microsoft Corp.'s Excel. Additionally, problems with keeping even the simplest networks up and running have proven daunting to managers trying to span multiple operating systems.

At the Apollo Group, a Phoenix-based parent of several companies in the adult education market, difficulty in running a network that includes an OS/2 development system, PC local-area network servers and clients and a Sequent Computer Systems, Inc. Unix minicomputer has led to a reassessment of future directions.

"We initially wanted to migrate PC LANs out to the campus locations so that student records would be more quickly accessible," says Matt Anticevich, Apollo Group's vice-president of operations, "but just keeping the system up has been so difficult that we are thinking about

using dumb terminals to connect directly to the Sequent system."

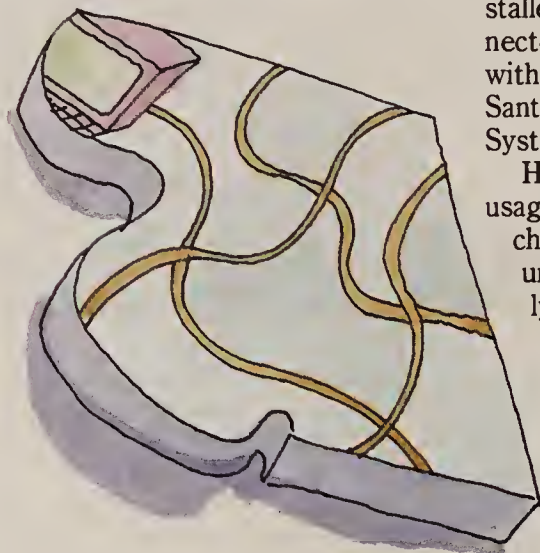
Despite the problems, users needn't despair. A few products that can help them integrate PCs are appearing. Sitka Corp., the former Sun Microsystems, Inc. TOPS Networking division, is probably the furthest along in its capability to place Macintoshes and IBM PCs on the same network.

Novell, Inc., the leading supplier of MS-DOS network software, has promised Macintosh facilities in its flagship Netware 386 product by the end of the year.

The need of the growing number of Unix users for more general-purpose applications has pushed a few developers to offer software bridges between Unix and DOS.

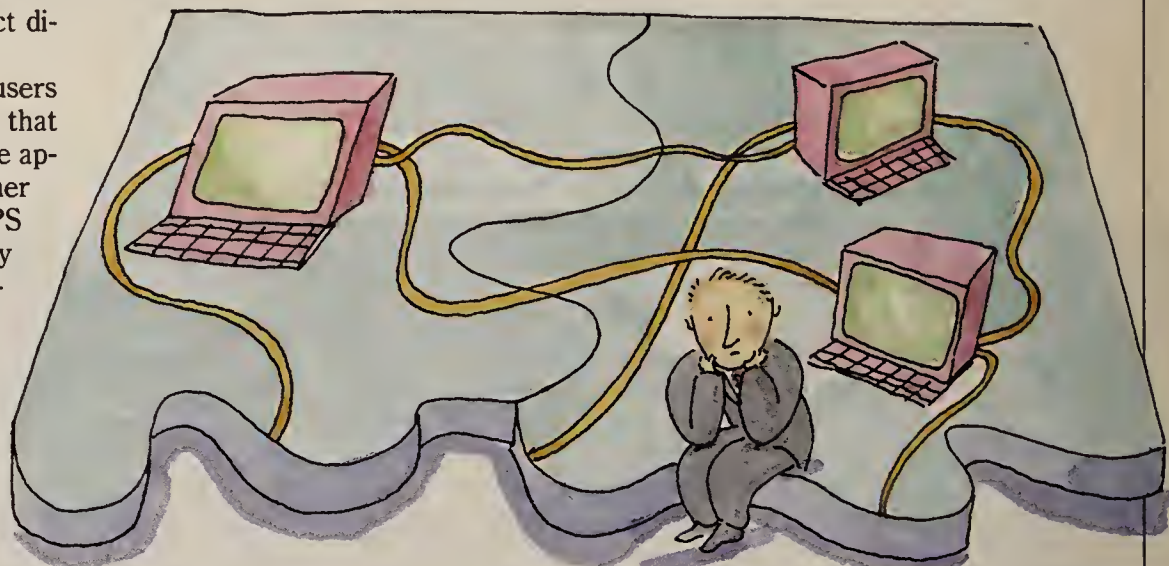
"Unix has a lot of power for development and graphics," says John McHugh, a PC specialist with Stasys, a consultancy in Hudson, N.H., "but a lot of general business applications have not been moved over from DOS." As a result, "The interconnect between Unix and DOS systems is becoming *the thing to do now*."

Talman-Home Savings and Loan Association, a \$6.5 billion thrift based on Chicago's Southwest side, opted for that route. Last year, the organization finished a project to automate all 51 of its branches. The



bank chose Intel Corp. 80286 and 80386-based NCR Corp. PCs running DOS for all of its tellers and officers. The PCs are hooked into an IBM 3084 mainframe running MVS/XA under CICS via NCR Motorola, Inc. 68040-based Tower 400 and 600 servers running AT&T Unix 5.3. Files are converted from DOS to Unix through NCR's Branch Integration System software bridge.

The goal of Talman's approach was to take advantage of distributed client/server capabilities that now allow loan officers, for instance, to quickly access files from multiple databases on the host machine.



Merle Nacht

Unix gives Talman, an institution that is heavily dependent on monetary transactions, "more reliable security features and a more robust multitasking environment," than competing environments, says Jim Wegmann, senior vice-president of Corporate EDP and Systems.

At the same time, keeping DOS on the desktop gives Talman significant cost-savings as well as a number of stable applications.

### Replaces 'floppy shoebox'

Another company connecting DOS and Unix machines is Hotelecop, a Miami-based nationwide facsimile transmittal service. The company installed an Ethernet network that connected seven DOS-based systems with two file servers running The Santa Cruz Operation, Inc.'s Xenix System V.

Hotelecop uses the PCs to track usage on its 2,100 remote fax machines. The PCs collect the data under DOS, but Hotelecop analyzes the data in SBT Corp.'s Six Plus Database Accounting Library, which runs under Xenix. The company originally transferred the data via floppy disks, but this proved "cumbersome," according to Chris McMorrow, director of IS for Hotelecop.

"We got to the point where we had shoeboxes full of floppies on a nightly basis," McMorrow says. Today, floppies are hardly used at all. Hotelecop began talking with Atlantix Corp. (then CNA Information Systems) about its Coconet software connectivity product. Coconet allows PCs to give DOS commands to gain access to the Xenix servers, the solution Hotelecop needed.

Often, DOS-Unix interconnectivity is being done with the help of software that allows DOS emulation within the Unix environment.

Like data transfer, however, emulation is a less-than-perfect way to in-

tegrate differing systems. "Any time you're trying to emulate, it really can end up costing you more headaches," said Dan Ness of Computer Intelligence in La Jolla, Calif.

One company that nonetheless chose such an approach is the Optifacts division of Vision-Ease Corp., a maker of unfinished lens blanks for eyeglasses. Optifacts, in St. Cloud, Minn., supplies optical calculation software to lens laboratories to allow for precise fitting of glasses.

Bridging the world of Unix and DOS in its software development labs lets Optifacts widen the market for its products. Jeff Mo, lead programmer/analyst for the company, says that while most of its customers use its Xenix software product, many wanted a cheaper DOS version.

The company now writes all its source code in Xenix, then translates it through SCO's VPIX DOS under Unix tool, essentially a DOS emulator. The executable code is tested and copy-protected within DOS, then shipped to the customer.

While Unix connectivity is hot now, blending OS/2 and DOS remains an important issue for some users. "Today, all LAN development assumes a mix of OS/2 and DOS in the future," says Monte Jones, MIS director at Kentucky Fried Chicken. "Microsoft has done a great job for us, but true DOS and OS/2 integration is still a way off."

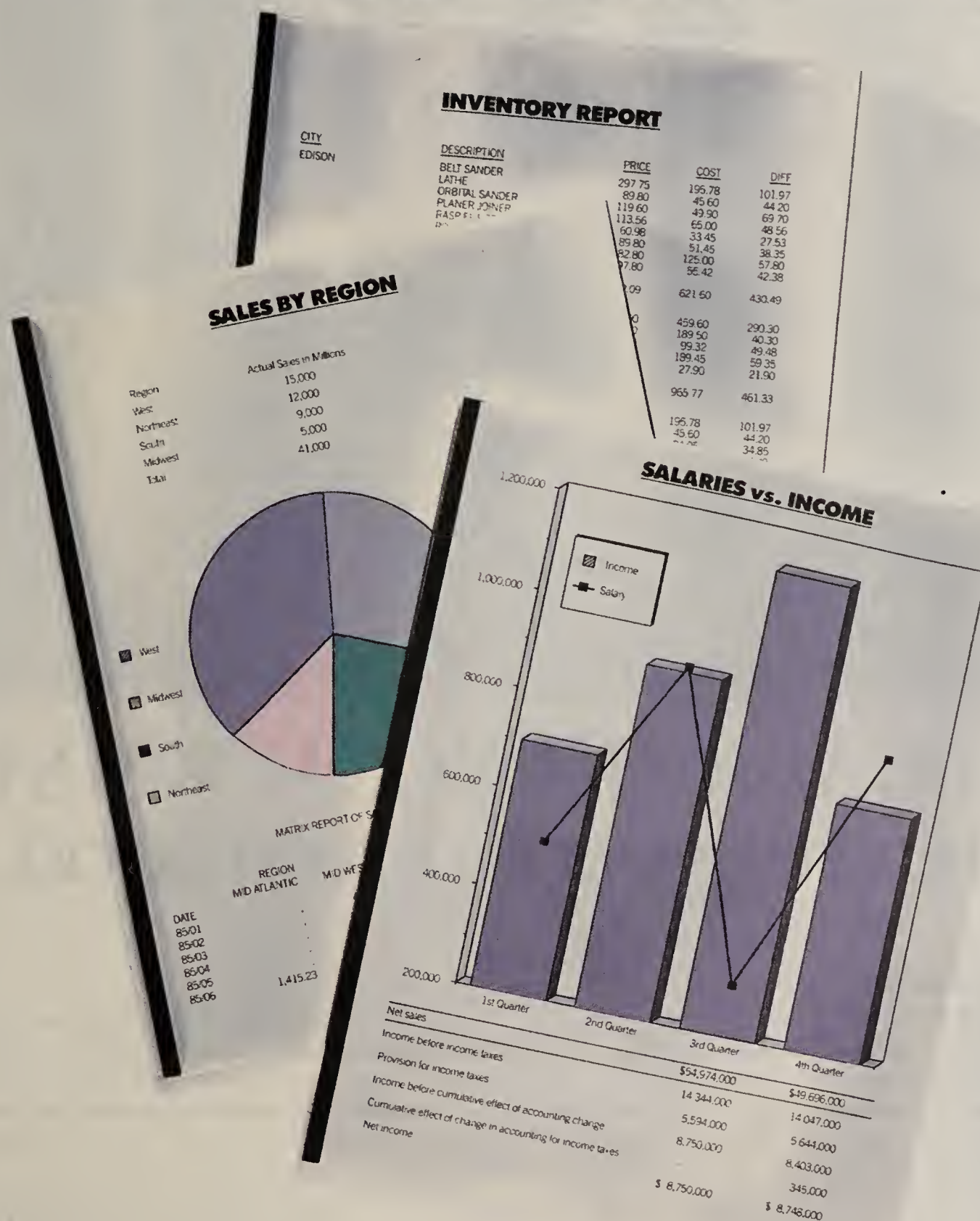
Charles Von Simson, a former CW senior correspondent, contributed to this report.



Kornel is a *Computerworld* senior editor, features. Fitzgerald is a *Computerworld* Chicago correspondent.

INTRODUCING FOCUS FOR TANDEM

# THE LATEST REPORTS ARE GOOD NEWS FOR TANDEM USERS.



What's news is that you no longer have to spend hours writing code to develop applications and produce reports.

Introducing FOCUS for TANDEM. The number one 4GL report writer now works with Tandem computers, to provide you with the tools to build entire systems, using code generators, editors, screen and window painters, and security controls. So you can write applications in a fraction of the time it takes with COBOL, C and other 3GLs.

FOCUS also lets you join relational and non-relational data. So you can link multiple NonStop SQL tables with Enscribe files, and even convert and populate new tables from existing files. You don't need to know SQL because FOCUS automatically generates the necessary syntax.

Your end users will be able to generate their own reports, graphs and queries from FOCUS' unique "point and click" TableTalk™ facilities. And without ever having to learn the FOCUS language.

As with all versions of FOCUS, your applications are portable between Tandem and all other major platforms. Such as IBM, DEC VAX, UNIX, and PCs under DOS, OS/2 and LANS.

For more information, call us at 1-800-969-INFO. Outside the U.S., call 212-736-4433 ext. 3700. Or you can write to Information Builders Inc., 1250 Broadway, New York, NY 10001. We'll be happy to give you the full report on FOCUS for TANDEM.

**FOCUS**  
Information Builders, Inc.

This advertisement refers to numerous software products by their trade names. In most, if not all cases, these designations are claimed as trademarks or registered trademarks by their respective companies.



# Switch to AT&T MEGACOM® WATS now. The change will do you good.

**You only need to bill 500 hours a month  
to save 40% or more on average.\***

With AT&T MEGACOM WATS you can save 40% or more off our basic long distance rates and get advanced high quality service. Plus you'll receive additional savings on international and AT&T Card calls. And the savings are automatic, increasing as usage increases. The more you use, the more you save.

## **Additional Savings.**

You can save even more with the AT&T MEGACOM WATS Term Plan. The plan offers a minimum discount of \$900 a year and can go up to \$66,000 a year. And if you sign up now, AT&T will waive the monthly charges. You don't even have to wait for installation to start saving. To save even more, take advantage of AT&T Shared Access for Switched Services (SASS). SASS allows you to make inbound and outbound calls over the same facilities. So you save on access charges.

## **The Guarantee.**

For a limited time, AT&T will waive the installation fees, including the charges to install the high-capacity digital access line.\*\* If you're using a carrier other than AT&T, we'll pay the majority of the switchover cost. And if after 180 days you're not fully satisfied, we'll even pay to switch you back to your previous carrier. All with AT&T quality and reliability.

**AT&T MEGACOM WATS.**  
*Another AT&T advantage.*

## **Act now.**

So for towering savings, sign up for AT&T MEGACOM WATS now. Call your Account Executive or 1 800 247-1212, Ext. 576 for details on these special offers.

© 1990 AT&T

Offer expires October 9, 1990. Installation needed by December 10, 1990.

\*Discounts on average as compared to AT&T basic interstate service for a typical business call. Actual savings may vary according to calling patterns and usage. Access charges not included.

\*\*Central Office Connection and Central Office Function charges not included.



**AT&T**

The right choice.

## 12 tips for better systems implementation

*A dozen ways to help executive management keep projects on track*

BY GLEN B. BECKLEY and  
MICHAEL GAINES

**S**orry, it's not my job." Few self-respecting chief executive officers or top executives would be caught dead making that remark. Yet that's exactly what happens on many systems implementation projects, particularly in midsize companies.

In many medium-size organizations — those with annual sales between \$40 million and \$100 million — senior management fails to take responsibility for a new information system, often delegating it to the vendor. In larger companies, the same thing occurs between a senior vice-president and the IS department.

The sad result? A good system from a competent vendor goes up in smoke or is only marginally useful. The portion of the system supporting strategic applications is often never implemented.

What executive behaviors doom system implementation projects? More importantly, what can IS organizations do to improve their success rate in implementing new systems?

To answer this question, we interviewed 15 software and hardware companies — including IBM, Hewlett-Packard Co., Digital Equipment Corp., NCR Corp., Unisys and ADP — along with implementation consultants and technical personnel in user organizations. Discussion focused on a typical midsize, closely held manufacturer or distributor

Beckley is a Portland, Ore.-based management consultant specializing in IS planning and implementation. Gaines is a professor of accounting information systems at Portland State University.

with a small in-house data processing capability.

What emerged were seven critical success factors. These are problem areas that user management needs to focus on to ensure successful systems implementation: staffing, project organization, project structure, project timing, project control, project communication, vendor relationships and training.

From these factors flowed several concrete suggestions for IS managers working with CEOs and other top executives in companies of every size. Following these tips can greatly improve an organization's chances of

**2) Encourage CEO ownership.** The single most important implementation problem is management's tendency to avoid "ownership" of the project.

Two types of executives typically abrogate responsibility: Skeptics tend to be overly conservative, questioning each decision and step along the way. The skeptic often appears to be resistant to the project. This confrontational style makes employees distrustful, vendors defensive and ultimately poisons the whole atmosphere.

Optimists are usually busy CEOs active in sales or business operations who simply ignore IS implementation. To vendors or the IS department they say: "I'll bet my company on your ability to install the system." They then promptly disregard the whole process and hope for the best.

Both of these extreme types have one thing in common: They place the responsibility for success in the lap of the system vendor or IS staff rather than with top management. Predictably, this tactic usually fails, because outside vendors lack the authority and detailed familiarity with the user organization to make successful implementation happen. Clearly, a careful delineation of responsibilities between the vendor and the user is very important.

**3) Help the CEO pick a good project leader.** A horrifying anecdote: One vendor reports that after brief consideration, the owner of one customer company gave project management responsibility to his favorite receptionist.

Projects will not get off the ground without a competent manager. This leader must create a climate of trust and remove FUD: fear, uncertainty and doubt. While technical competence in data processing is not usually a prerequisite, a broad understanding of



Josef Gast

success in implementing new systems.

**1) Realize the boss may be wrong.** CEOs in many midsize organizations tend to draw on their experience with other kinds of projects. All too often, these prior experiences mislead the CEO into underestimating the complexity of a systems implementation project.

As a result, the company is vulnerable to implementation failures — even after successfully completing the design and acquisition stages. The end result is that projects often are not financed, staffed, managed or prepared properly for the changes inherent in implementing a new system.

- Faster access for more users
- Connect remote sites without new hardware
- A big step toward interconnectivity

company operations and good attention to detail is crucial.

The project leader must be a person who can work comfortably with top management. The person needs sufficient stature within the firm to motivate all personnel involved. Assigning someone with less clout sends the wrong message to employees about the importance of the project and the commitment of management to successful implementation.

**4) Encourage appropriate CEO involvement.** The right amount of CEO involvement is directly related to the size of the company and project. The depth of involvement will vary depending on specific circumstances.

Minimally, the CEO should attend key milestone meetings and participate in ma-

**F**OCUS MORE on creating a partnership with the vendor's representatives rather than viewing them as adversaries.

ior design decisions, if appropriate. The CEO also should be encouraged to drop in on training sessions or other meetings related to the project to get a sense of how well the new system and related changes are being accepted. If the CEO sees bickering going on, then he should get more directly involved.

Expanded duties may include assigning

competent personnel, creating a project organization structure, establishing a project control approach, setting up channels to ensure good communication, establishing of a vendor relationship and managing follow-up to ensure that the above processes are working as intended.

It is also useful for the CEO to participate in giving awards to employees to recognize the extra effort required in systems implementation. Small gifts, such as tickets to sporting events or the theater, demonstrate top management's recognition of and appreciation for a job well done. It also reinforces the employees' impression that top management really cares about the systems project.

While CEO involvement is crucial, too much can be just as bad as none at all. Get-

ting top management involved in technical details such as part-numbering schemes or monitor screen designs, for instance, can frustrate employees, lead to inappropriate decisions and generally bog down implementation.

**5) Establish good vendor relationships.** A badly needed attitude change was summed up by one interviewee: "Americans often expect the vendor to take primary responsibility for computer projects, especially when there is a lot of money involved. Orientals, on the other hand, tend to view the vendor as an intimate partner in the project and work hard to define mutual responsibilities and to keep a good relationship going."

There's a clear lesson here for executives and IS managers: Focus more on creating a partnership with the vendor's representatives rather than viewing them as adversaries. The goal should be to establish a relationship that is more like a partnership than a traditional supplier/vendor relationship.

The CEO should establish a relationship with the vendors in which frank communication is encouraged. This lets the vendor use the CEO's knowledge of the organization to bring about a successful implementation.

**6) Encourage the executive to manage the vendor's time.** Vendors' charges are often based on time spent, so it is crucial to see that their time is not wasted. Yet, smaller companies often fail to manage the vendor's time, which can lead to inefficient meetings.

For example, suppose the vendor plans to meet with the controller to discuss the design of the chart of accounts. The project leader should encourage the controller to prepare a draft chart of accounts before the vendor arrives. Taking this initiative to work on the task first will ensure that the vendor's contribution will be maximized.

To keep company control, CEOs should be encouraged to give the project leader control of the vendor's on-site support time, as well as off-site billable time. The project leader should make sure that the project team understands precisely what the vendor proposes to do. The team should evaluate which tasks the vendor can do most cost-effectively and which should be done in-house.

**7) Create an open climate.** Many interviewees cited situations in which the CEO made the IS purchasing decision without asking for input from company personnel responsible for implementing and using the system. In this case, the CEO may own the project but the employees do not.

When they have not been convinced of the benefits of the system, employees are likely to feel insecure about the changes that a new system may bring. Ultimately, this strategy is wasteful, because it forces the vendor to go through a second sales cycle to convince users that the system will not threaten their jobs and will improve their efficiency. The company ends up paying in extra time and dollars for this form of implementation support.

Clearly, the time to gain employee support is during the sales cycle by inviting participation in system evaluation, selection and design. Users will then feel that it is their system from the very beginning.

**8) Don't forget politics.** CEOs should be reminded of the ever-present potential for political problems. Internal politics were cited as one of the most difficult problems to overcome during



## How UDS squeezes more out of the V.32 standard

Believe it! In the hands of UDS engineers, the V.32 standard means a lot more than 9600 bps, full-duplex.

Every UDS V.32 is fully compliant with the CCITT recommendation, but that's only the beginning. Model V.3225, the latest in the UDS V.32 family, offers lots of extra features.

First of all, there's MNP® level 5, the data compression/error control technique that increases data throughput by as much as a 2:1 ratio. In other words, a UDS V.3225 can give you full-duplex error-free communication at 19.2 kbps!

When your dedicated line goes down, V.3225 is the ideal dial back-up

solution. It even checks the dead line periodically and switches back to it as soon as it's available.

Then there's V.22 *bis* operation; if your V.3225 receives a call at 2400 bps, it automatically drops to that speed, and full-duplex communication goes on.

Got a real data density problem? The card you get in your free-standing V.3225 can be plugged directly into the Universal Data Shelf™, giving you as many as 16 channels in a standard 19- or 23-inch equipment rack.

To learn how the V.3225 can squeeze more from your datacomm system, contact UDS, 5000 Bradford Drive, Huntsville, AL 35805-1993. Telephone 205/430-8000; FAX 205/430-8926.



**V.3225**  
QUANTITY ONE PRICE:  
**\$1145**



Created by Dayner/Hall, Inc., Winter Park, Florida

systems implementation. One interviewee stated that as much as 25% of her firm's implementation support fees were spent dealing with internal political issues.

One of the best ways to minimize political problems is to keep all participants informed through frequent project status meetings attended by the CEO. When factional opinion leaders emerge, they should be singled out by the project leader for special attention to ensure that their concerns are being addressed.

Worries often crop up because system implementation projects can change the work environment, which threatens the internal pecking order. For example, new system responsibilities might elevate a person with relatively low status into a highly visible position. This kind of change can cause serious political battles as some individuals or groups try to maintain the status quo while others try to manipulate change to further their political interests. The remedy is to continually emphasize commitment to the project rather than commitment to an internal political faction.

**9) Get the right project structure.** In general, larger companies need more formal organizational structures than do smaller firms. In big companies, overall

**ONE OF THE best ways to minimize political problems is to keep all participants informed through frequent project status meetings attended by the CEO.**

direction of the project team usually comes from a steering committee. Typically, this committee is made up of department heads from each of the departments affected by the new system.

The committee controls the setting of priorities, major expenditures and significant design decisions. The project team reports to the steering committee on a regular basis regarding project status, major milestones reached or missed and other issues deemed important by the project team. Structure is needed because the new system requires detailed coordination between most departments in the organization.

It's very important that project leaders report to a top-level manager with clout. This person must have the authority to alter and reorder individuals' work assignments and jump-start projects stalled by organizational politics.

For example, the project leader may not have the organizational clout to convince a department to spend the necessary time getting ready to convert to the new system. He therefore must have direct access to someone who does have the necessary clout to get the job done in order to keep the project on track, on time and on budget.

In some organizations, the chief financial officer may not be the right person for this job for two reasons. First, the CFO may lack the needed clout, especially when compared with line executives in sales and operations. Second, the CFO might be more focused on the accounting systems than the operations systems.

**10) Encourage realistic expectations.** CEOs often do not understand or

appreciate the substantial effort required of their employees in implementing a new system. They may view the installation as a "slam dunk." This unrealistic attitude is usually caused by overzealous sales professionals who underestimate the level of commitment required. Or it may be a failure of the CEO to become sufficiently involved in the project to develop an understanding of the implementation tasks.

The CEO should be advised to understand staffing needs during the sales cycle. This can be accomplished by asking the vendor to recommend a level of support consistent with the capabilities of the organization.

**11) Encourage executive follow-up.** When employees know that management checks their progress at project sta-

tus meetings, they are much more apt to focus on getting their assigned tasks done on time.

**12) Encourage good project timing.** It is typical for user management to start the project too late — for example, to meet a year-end deadline — and to be optimistic regarding the effort required. After all, the sales representatives may have instilled a "warm fuzzy" feeling by creating expectations that prove to be unrealistic.

New systems often change the way a company does business, so major changes require careful planning, setup, testing and execution. Done properly, such activity takes time.

A recommended way to get a good idea of the actual time required is to ask the

two or three finalist vendors during the presale period. They can work individually with user staff to develop a realistic implementation plan. Each vendor probably will have a somewhat different perspective, offer different ideas and emphasize different aspects of the project. Reconciling these differences should form the basis of a reasonable estimate of the number and type of user personnel actually required for the job.

Momentum is an important aspect of project timing that is often overlooked. Companies usually lose momentum after the first application of the system is implemented. IS managers must keep the project alive and overcome the natural resistance to starting the next application project. •

## Now You Don't Have To Be An Egghead To Understand UNIX® And Open Systems.

*If you're a business or technical manager, senior executive, power user or reseller, finally there's a UNIX/open systems trade show just for you.*

UNIX SOLUTIONS was developed to provide the practical knowledge and useful information you need to better understand the power and flexibility of a corporate open computing environment operating under UNIX.

Come see all the latest business applications as well as those currently under development. Evaluate the hardware, networking equipment, peripherals and services that can get your company up and running.

Come learn from a truly unique conference program. The 40-session

agenda has been expressly designed to de-mystify open systems computing. Discover how and why you should implement a system of your own. Hear consultants, corporate end-users and resellers discuss their first-hand experiences building cost-effective corporate systems.

Come to UNIX SOLUTIONS. Where you don't have to be an egghead to appreciate the benefits of UNIX and open systems.

Don't pass up this valuable, once-a-year opportunity. To receive your free information package, return the coupon. For immediate action, call (617) 449-6600; fax (617) 449-6953; or telex 174273.

### I need answers.

Tell me more about UNIX SOLUTIONS in Anaheim, October 3-5, 1990.

Send me information about:

- ☐ Attending the conference.  
☐ Attending the exhibit floor  
☐ Exhibiting.

Name

Title

Company

Address

City

State  Zip/Postal Code

Country

Phone (  )

Fax (  )

Best time to call

Mail to: UNIX SOLUTIONS, Direct Marketing Services, CWS/6  
300 First Ave., Needham, MA 02194 USA

**UNIX**  
**SOLUTIONS**  
EXPOSITION AND CONFERENCE<sup>SM</sup>

### Introducing The Open Systems Trade Show Where UNIX Gets Down To Business.

October 3-5, 1990 • Anaheim Convention Center • Anaheim, CA

©1990 • The Interface Group • 300 First Avenue, Needham, MA 02194 USA • UNIX is a registered trademark of AT&T.



# The new look of power.

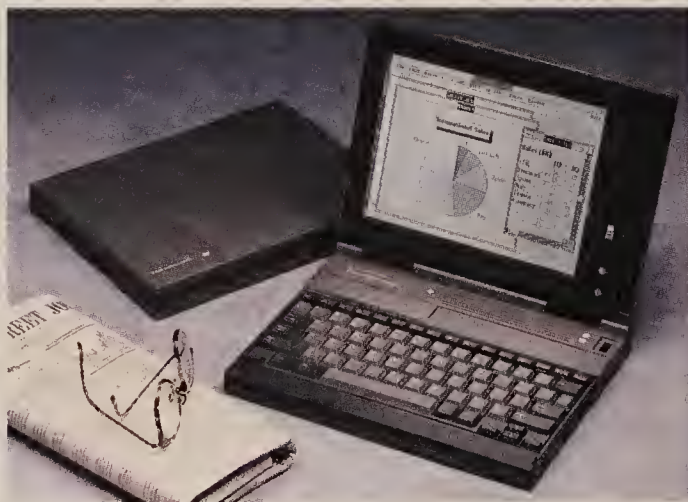


286 processing in a computer that's notebook size,  
1.4" thin and 4.4 lbs. light.

Introducing the  
TI TravelMate™ 2000  
notebook computer —  
from the company  
that pioneered portable  
computing solutions.

Since inventing the first portable data terminal in 1969, TI has led the way in packing more and more functionality into smaller and smaller products. Now TI brings you the next generation in portable computing — the TravelMate 2000.

This sleek, 4.4-lb. notebook computer gives you the power of a PC-AT® in an ultrathin 8½" x 11" package. It's designed to fit your workstyle — wherever you work — in the office, at home or on the road. Just slip it in your briefcase with your file folders, journals and other business materials, and you're ready to go.



## Large VGA screen with leadership display technology.

You'll appreciate the technology behind the 10" diagonal VGA display. It's a remarkable feature for a computer that's notebook size. The high-resolution 640 x 480 supertwist screen easily handles demanding windowing and graphics applications.


## More features to meet your application needs.

The TM 2000 has the power to run your favorite software — 12 MHz 80C286 processor, 20MB hard disk drive and 1MB of RAM. A built-in, rechargeable battery lets you work up to two hours. With an optional add-on battery, you can work up to five hours — enough for coast-to-coast flights.

You also get a full-function AT enhanced keyboard, so you can work with the same feel of your desktop PC.

In addition, we've loaded MS-DOS® and LapLink™ in ROM, and preformatted the hard disk.

For more information call  
1-800-527-3500.

  
**TEXAS  
INSTRUMENTS**

# COMPUTER INDUSTRY

## NATIONAL BRIEFS

### I can't get no...

Despite a blizzard of words declaring their devotion to the customer's needs, U.S. computer firms are falling short of satisfying customers. So said market research firm **The Sierra Group, Inc.** in a recent report. Based on a survey of 1,862 information systems executives, "this year's study illustrates an across-the-board decline in customer satisfaction in all categories of vendor performance over 1989 levels," it said. Consistent user-pleaser **Hewlett-Packard Co.** topped the ratings, but on the scale of one to 10 used by Sierra, HP's score dropped from last year's 8.3 to 7.9.

### Big Bluegrass

The **University of Kentucky** zoomed last month into the top ranks of U.S.-based universities with academic computer support, courtesy of its research partner, **IBM**. The firm sealed its new supercomputing research alliance, expected to move into full gear over the next few months, with one of the largest gifts the university has ever received: \$4.9 million toward purchase of an IBM Enterprise System/3090 Model 600J.

More national briefs on page 92

## Apple's savior across the sea

*European branch's success keeps U.S. parent organization on growth track*

BY RICHARD PASTORE  
CW STAFF

**W**ith the U.S. personal computer market plodding along at a turtle's pace, vendors are leaning more heavily on jack-rabbit-fast international sales. These markets, therefore, are also looming larger for U.S. users concerned about the health of their suppliers.

Robust markets in Europe and elsewhere are "crucial to the growth of these companies," said Peter Rogers, an analyst at Robertson, Stephens & Co. in New York. "That relative [U.S.] weakness has been offset by better growth in Europe and Asia."

A case in point is Apple Computer, Inc., which garnered 42% of its total net sales from overseas last quarter — a rise of 3% from the previous year. The European market generated the vast majority of this revenue.

A \$1.2 billion enterprise in 1989, Paris-based Apple Europe has been logging year-to-year growth figures in the 40% ballpark — a number most mature U.S. vendors only dream of.

The major secret of Europe's success is that the market is two to three years behind the U.S. in maturity, according to Jean Calmon, Apple Europe's director of strategic business development. "There is no saturation in Europe; there is a huge potential in large corporations," he said.

Still, analysts with their ears to the European track have said that the gravy train may be slowing for the big players.

Smaller firms such as Dell Computer, Inc. and AST Research, Inc. are eating into Apple's and Compaq Computer Corp.'s European market share,

according to Jim Poyner, an analyst at William K. Woodruff & Co. in Dallas.

Apple's international growth slowed 9% year-to-year this past quarter. Western Europe's business and professional PC demand is expected to grow 36% this year — down 16% from last year's growth figure, according to London-based IDC Europe.

Calmon admitted that Apple Europe's growth in corporate accounts has leveled off, but he attributed this to

"just average," according to Calmon. The problem is educational software — or, rather, the lack of it. The solution, Apple said, will come from the establishment of support programs to encourage curriculum software development.

The firm is moving slowly to establish a beachhead in Eastern Europe as well. "We don't want to get in, make money and run," Marketing Director Guerrino De Luca said of the Eastern

### Apple Europe: Future windfall?

*The U.S. entrepreneurial prototype is looking to seed overseas territory*

Europe offers Apple the chance for a rich harvest:

- 🍏 A business and professional market that grew 52% last year and is estimated to grow 36% this year
- 🍏 The lion's share of Apple's overseas revenue, which accounted for 42% of corporate sales last quarter
- 🍏 A market that has yielded annual growth figures of approximately 40% for Apple



Jean Calmon

CW Chart: Marie Haines

a redirection of company resources toward expanding the dealer channel.

"Maybe we did not devote enough resources [to the corporate market], but we had to attract some new players in the channel, and that's not an easy job," Calmon said.

"There are not a lot of people in our organization," he added. "We can't do everything at the same time."

To offset the market slowdown and competitive incursions, Apple is concentrating on expanding existing markets and penetrating new frontiers.

Currently, about 21% of the firm's revenue is derived from the education market. Growth in this niche has been

European markets. "We will find partners and build an infrastructure."

The firm is counting on long-term rather than near-term profits from the region. "We're not expecting to make much money in the next two years," De Luca said. He added that Apple's first foray will be launched in West Germany and Stockholm. The first Apple resellers will likely open their doors in East Germany, Budapest and Moscow sometime this year, De Luca predicted.

While it may share a diluted version of the problems that beset its parent, Apple Europe is still doing well enough

*Continued on page 89*

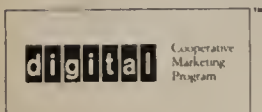
# THINK DIGITAL • THINK ROSS

The best financial, distribution and human resource software for the Digital VAX™ system.

Call Ross today for more information: 415/593-2500, Ext. 173

**ROSS SYSTEMS**  
THE DIGITAL STANDARD

555 Twin Dolphin Drive, Redwood City, CA 94065



VAX is a trademark of Digital Equipment Corporation.



# Meet the #1 Software for a Growing Family

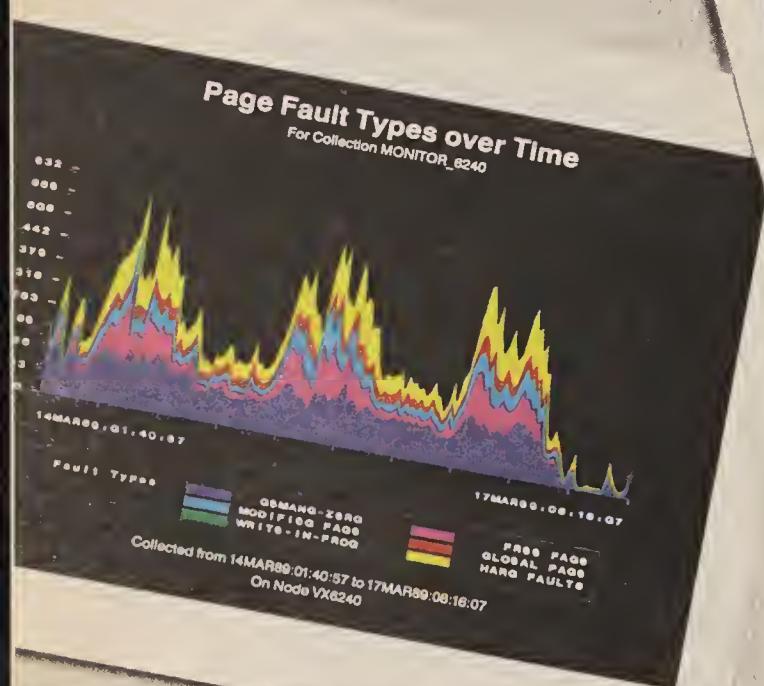
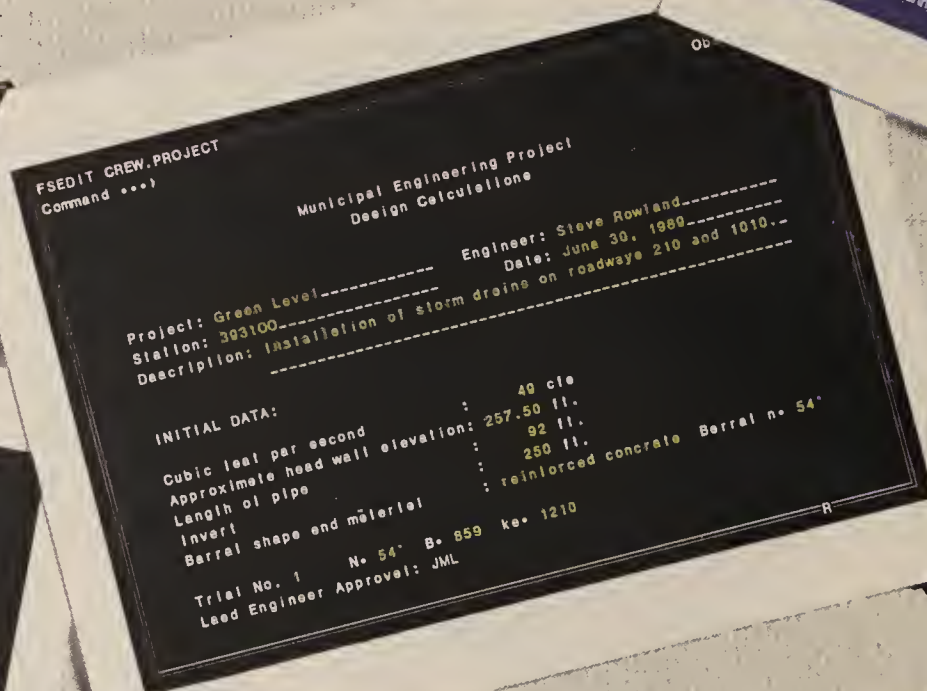
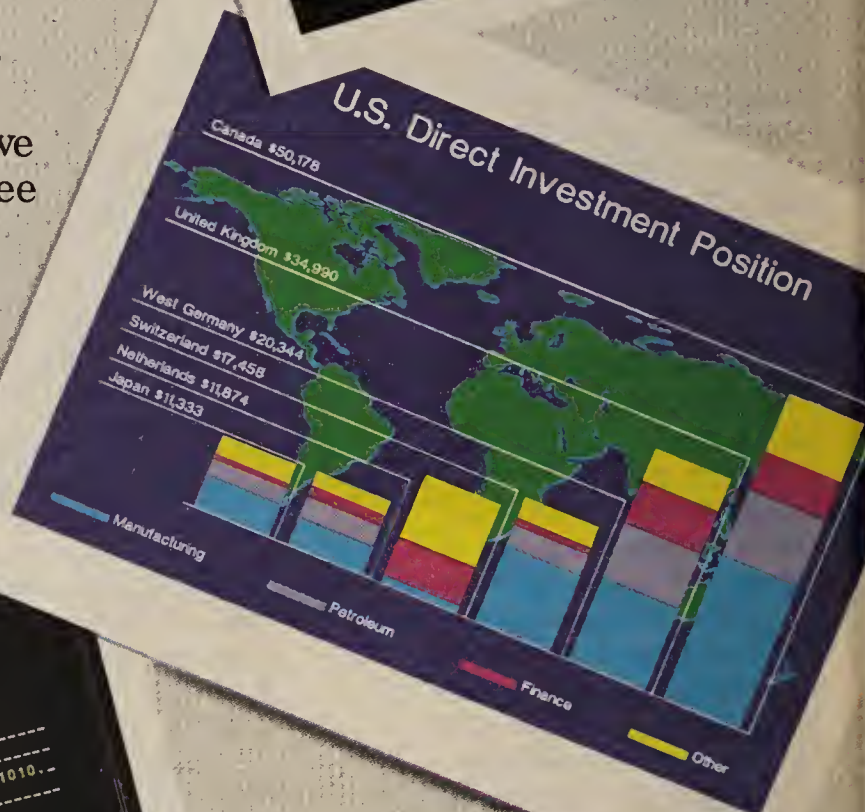
The more you rely on the expanding family of VAX™ computers, the more you need the SAS® System—the leading data analysis and graphics software in the VAX market. No other software has the power and flexibility to handle *all* your data management, analysis, and presentation needs. Across the entire range of VAX systems.

The SAS System brings you more choices for data entry, retrieval, and management... report writing and graphics... statistical and mathematical analysis (including quality control)... business planning, forecasting, and decision support... operations research and project management... and applications development. All fully integrated. All backed by VMS-specific technical support, training, and documentation.

And now we've extended the family with specialized tools for evaluating VAX computer performance, as well as interfaces to popular data bases such as ORACLE® and Rdb™. No wonder experts call the SAS System "...perhaps the most sophisticated and versatile family of products on the market."\*

## Yours for 30 days... FREE

Find out why the SAS System is the software you won't outgrow. Ask for our free 12-page executive summary and details about a free 30-day software evaluation. Call us today at (919) 677-8200. In Canada, call (416) 443-9811.



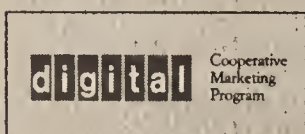
**The SAS® System.  
More Choices  
for More Applications  
than Any Other Software.**

\*Digital Review. Reprint available.

The SAS System runs on the entire family of VAX minicomputers and workstations under VMS. Mainframes, personal computers, and UNIX-based workstations from other vendors are also supported.

SAS is a registered trademark of SAS Institute Inc. VAX, VMS, and VAX Rdb/VMS are trademarks of Digital Equipment Corp., and ORACLE is a registered trademark of Oracle Corp.

Copyright © 1989 by SAS Institute Inc.  
Printed in the USA.



SAS Institute Inc.  
SAS Circle □ Box 8000  
Cary, NC 27512-8000  
Phone (919) 677-8200  
Fax (919) 677-8123

# Look-and-feel suits: Not just for spreadsheets

BY NELL MARGOLIS  
CW STAFF

CHICAGO — Last year, Innovis Interactive Technologies' backyard deck designing software won its company a *Computerworld Smithsonian Award* for technology innovation. Now the Tacoma, Wash.-based division of forest products giant Weyerhaeuser Co. is looking for another award — this time, from a federal district court jury.

Weyerhaeuser late last month filed a "look and feel" copyright infringement competition suit against Buffalo, N.Y.-based Osmose Wood Preserving Co. of

America, Inc., a wood treatment company with a deck design package whose user interface and visual display are, Weyerhaeuser contends, suspiciously familiar.

Innovis' Designcenter package, created particularly for use in lumberyards and do-it-yourself centers, was designed to appeal to even the most naive end user, said Innovis President Mark Lembersky. By following a prescribed sequence of visually indicated steps, the Weyerhaeuser complaint said, the would-be builder can create on a computer screen a backyard deck of his own custom design, tailored to his yard and house.

In addition to an opportunity to try out

the deck on-line before building it, Designcenter supplies the would-be builder with materials and hardware requirements for the planned structure.

## User confusion?

In its complaint, Weyerhaeuser charged that Osmose copied the copyrighted Innovis design for its Backyard Designer Series deck design software. Furthermore, Weyerhaeuser said, Osmose's placement of its product in the very same lumberyards and do-it-yourself centers that were scoped out as Designcenter territory is potentially confusing to users, who might not know which is which. Weyerhaeuser

added an unfair competition count to its complaint, which seeks an injunction against Osmose and monetary damages as well.

"Our copyright and the system itself represent a significant investment for our company and an unmatched standard for retail applications of visual design technology," Lembersky said, adding that the copyright will be vigorously protected.

At least one Innovis user no doubt was left applauding the sentiment. Innovis was nominated for the *Computerworld Smithsonian Award* by Lotus Development Corp. Chairman Jim Manzi — who, with his own firm currently blazing legal trails in the much-debated area of software copyright protection, is no stranger to look-and-feel cases.

## Sybase demurs on stock IPO

BY JEAN S. BOZMAN  
CW STAFF

EMERYVILLE, Calif. — Sybase Inc., the 5-year-old relational database company, has decided to defer an initial public offering of its stock despite widespread Wall Street expectations that the firm would go public sometime this quarter.

"Once you go public, there's no going back," said Stewart Schuster, Sybase's marketing vice-president. "There's more than one way to raise money, but there's no way to run at 100% growth rates without having to raise the cash to finance that growth."

Analysts last week put their own spin on Sybase's retreat from the public market. "I'm suspecting they ran into short-term profitability problems," said Kenneth Burke, an analyst at Alex. Brown & Sons, Inc. "If revenues are going through the roof, [but] you're not making any money, then you come off looking deficient to potential investors."

The firm took an alternative route to additional funding and extended an investment option with Cambridge, Mass.-based minority owner Lotus Development Corp. Lotus owns 15% of Sybase's stock and has an option to purchase 10% more. Terms of the option extension were not disclosed.

Sybase executives said that they have decided to grow their \$57.3 million business "substantially" in 1990, possibly doubling its size, on the strength of privately raised funds. In addition to Lotus, its list of private investors includes TRW Corp. and Apple Computer, Inc.

Still, Wall Street had been eagerly awaiting a Sybase initial public offering for months. "It's a well-known firm that's done a very good job of marketing," said Bruce Lupatkin, senior technology analyst at Hambrecht & Quist, Inc., which has made an investment in Sybase.

Sybase has not ruled out a future initial public offering, Schuster said, but as of now, there is no official target date. "One of the advantages of being a privately held company is that you are able to execute a long-term strategy rather than a quarter-to-quarter strategy," Schuster said. There is another advantage, he added: "If you can raise money at attractive prices in a private market, as opposed to a public market, it typically takes less time to consummate the deal."

# Guess where business goes shopping and win \$10,000 spending money.

Here's your chance to prove you're a marketing genius and win \$10,000 in the bargain.

We asked 9,823 business and professional executives what sources they find most useful in providing information about the products and services they buy for their companies. You can win our \$10,000 jackpot by simply ranking the sources from 1 to 13 in the order that you think our survey respondents ranked them.

We'll tell you what came in second to get you started: It might surprise some people, but trade shows finished #2.

And we'll give you a hint about who's #1. It's the selling medium that:

- Speaks the business and professional buyer's language.
- Provides an environment with built-in credibility.
- Is loaded with helpful information about product and industry developments.

Now just get the rest of the answers right and you could win plenty of cash to go on a personal shopping spree.

Good luck.

# ABP

Where business goes shopping

No purchase necessary. For prize eligibility your entry must be received by September 4, 1990. To receive the correct ranking of information sources and complete rules, send a self-addressed stamped envelope (WA residents need not affix return postage) to: ABP's Survey Rankings and Jackpot Rules, 675 Third Avenue, Suite 400, New York, N.Y. 10017. Sweepstakes open only to residents of the 50 United States and District of Columbia. Employees as of 9/4/90 of all trade and consumer media organizations, the American Business Press, its agencies, the D. L. Blair Corporation and members of their immediate families are not eligible.

## OFFICIAL ENTRY FORM

Directories ☐

Consumer Magazines ☐

Daily News-Papers ☐

Radio ☐

Trade Shows ☐

Sales Reps. ☐

Direct Mail ☐

Business & Professional (Trade) Magazines ☐

News Magazines ☐

General Business Magazines ☐

Cable T.V. ☐

Network T.V. ☐

Conventions & Seminars ☐

NAME

TITLE

COMPANY

ADDRESS

CITY  STATE

ZIP

PHONE

RETURN ADDRESS:  
ABP's \$10,000 JACKPOT  
675 3RD AVE., SUITE 400  
N.Y., N.Y. 10017

# Users from Italy to Iceland rely on SAS

BY SALLY CUSACK  
CW STAFF

CARY, N.C. — Norwegian officials rely on it to analyze the fishing season in the Bering Sea, financiers use it for banking applications in Rome, and an Iceland-based supermarket chain runs it for report analysis.

It is the SAS System, an integrated applications software package developed by the SAS Institute, Inc., a privately owned firm reputed to be the 11th largest in the industry. The software vendor grossed \$205.6 million in 1989 worldwide sales

and seems to be maintaining its upward spiral.

The firm, whose U.S. staff was increased by 220 last year, said there has never been a layoff or attrition program since it was founded in 1976.

Perhaps the steady growth pattern can be attributed to a successful combination of the marketplace, the product line and the firm's somewhat unique approach to management/employee relations.

James Goodnight, president and co-founder of SAS, said he implements a liberal brand of management. "I try to listen to what developers and managers are say-

ing," he said. "Granted, management-by-consensus is more time-consuming, but it tends to keep people motivated and helps to satisfy their creativity. New ideas lead to new products."

The SAS System is the organization's flagship product, built on a multivendor architecture that allows it to operate with as well as under a variety of hardware and software platforms, such as those from IBM, Digital Equipment Corp., Sun Microsystems, Inc., Oracle Systems Corp. and Computer Associates International, Inc.

Originally developed as a statistics

package, the product has expanded over the years to provide data access, data management and graphical presentation capabilities. The program found its first niche among graduate students in the U.S. and has gained much of its solid reputation via their word-of-mouth endorsements.

Larry Pohlman, an associate at Blackstone Financial Management in New York, said he remembers being introduced to the SAS System as a graduate student at Columbia University back in 1979. "I was really impressed with the easy-to-use language," Pohlman said, adding that whenever he has changed jobs or positions, he has always asked for the SAS System to be installed on at least one of the computers to which he has access.

The firm has attracted a very large and very loyal user base over the years. However, with the establishment of 21 subsidiaries overseas, — starting with one in the UK in 1980 — it is working on establishing the same kind of trust on an international basis.

"We're going to do it through strong, local support," said Barrett Joyner, director of U.S. marketing at SAS. "It's a combination of local employees plus technical support via our satellite network. The literature, interfaces and tutorials have been retooled in different languages, and the subsidiaries will always have access to the actual software developer."

The firm's European operation in Heidelberg, West Germany, accounts for 32% of new sales, Goodnight said.

## Home support

SAS extends the same intensive support commitment to its users at home. An entire building at the SAS is devoted to classrooms for seminars, lectures and hands-on training classes; another building is under construction for producing video tutorials. The organization sends out a quarterly video newsletter to its regional user groups. The videos include question-and-answer sessions, product previews and how-to tips.

"We are continually listening to our customers' needs through surveys, ballots and over the phone," said Goodnight, who still devotes approximately 45% of his time to software applications development. He keeps a manual of documented user feedback on his desk.

"Research and development are our strongest assets," said Wink Swain, SAS' marketing communications at the Institute. "We don't want our users to hit a brick wall when they reach the culmination of a program," Swain said. SAS relies on users for a "broad-based view" of the world and allocates 45% of its revenue spending for R&D.

There are 1,400 employees at the North Carolina headquarters, which covers more than 100 acres of land and encircles a six-acre lake. Employees call it "the campus," because of the facility's unusual ambiance: Canoes float on the lake, children play on swings, and employees play chess and listen to music played softly on a grand piano. Among the large buildings "on campus" is a full-scale gymnasium complete with a Nautilus room, a two-tiered cafeteria, tennis courts, and several on-site child-care centers.

The feeling that the headquarters is a campus reflects not only the general atmosphere of the place but also the firm's origins. Before coming to SAS, Goodnight was a professor of statistics at North Carolina State University in Raleigh.



## NETWORLD 90<sup>SM</sup> DALLAS

September 10-13, 1990 • Dallas Convention Center

NetWorld 90 Dallas has moved to a site almost as large as Texas — the Dallas Convention Center. More than 400 exhibitors will showcase the latest technology that links your information systems together, from LANs in the corner office to strategic networks that span the globe. NetWorld 90 Dallas needs no further introduction; the show has become the industry's hottest high technology event, according to exhibitors and attendees alike!

Professionals do need to make the right connections in order to succeed in business, and

planning makes the difference in finding the solutions for your business needs.

Mark your calendar now to attend the world's most extensive event on computer connectivity, product technology and education. The highly regarded NetWorld seminar series begins on Monday, September 10, with the NetWorld product and services exposition opening on the 11th and continuing to the 13th. For your full attendee program guide or information on exhibiting in NetWorld, please call 1-800-444-EXPO.

# Computerworld

## EDITORIAL REPRINTS

Reprints from *Computerworld* provide a valuable marketing/sales tool for your company!

Editorial articles are available as reprints and can be ordered in various quantities, and customized to include your company logo and sales offices. Whether you wish to have reprints of an article written specifically about your company or a subject of general interest, these reprints\* can be a great resource for use in:

■ Promotional/P.R. materials ■ Internal meetings ■ Company seminars

\* Produced in minimum quantities of 500 for black-and-white and two color reprints; 1,000 for four-color reprints.

For complete information on ordering reprints contact:

Sharon Bryant  
Reprints Department  
Computerworld  
375 Cochituate Road  
Framingham, MA 01701-9171  
Tel. 508-879-0700



### COMPUTERWORLD

The newspaper for information systems management

# Forget Everything Your Mother Taught You About Sharing.

Remember what your mother taught you about sharing? It doesn't apply to *Computerworld*.

That's because nobody's willing to give up *Computerworld* until they've read all about the products and people, trends and technology, issues and information that shake the IS community each week.

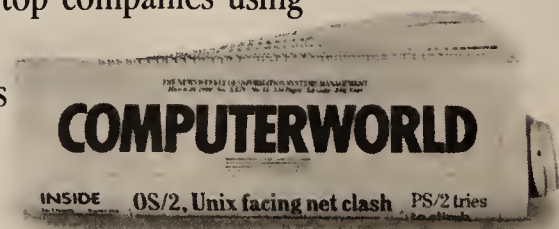
Which means it could be days before your company or department subscription reaches your desk.

So order your own copy of *Computerworld* and get the latest, most up-to-date news while it's still hot. And while you can still use it to get an edge on the competition.

You'll receive 51 information-packed issues. Plus you'll get our special bonus publication, *The Premier 100*, an annual profile of the top companies using information systems technology.

Use the postage-paid subscription card bound into this issue to order your personal copy of *Computerworld*.

And if someone asks to borrow it, tell them to get their own. Your mother will understand.



The Newsweekly of Information  
Systems Management

# Systems integration rings bells

*Regionals brand systems integration as the hottest business niche to hit*

BY ELLIS BOOKER  
CW STAFF

The urge to branch out is not new to telephone companies. Diversifying beyond basic telephone services, the nation's regional Bell holding companies have entered many businesses, including cellular, telephone directory publishing and telecommunications equipment sales.

Recently, however, a number of them have embarked on what is perhaps the hottest computer service niche: systems integration. Some have entered the market through acquisition; others have established partnerships with established players.

However, all are faced with defining themselves in a crowded arena while leveraging off the considerable presence of their local phone companies among potential customers.

With their cash reserves, the regionals "have no problem bellying up to the bar and spending a couple hundred million," said Rich Peterson, head of Impact Research, Inc. in Upper Montclair, N.J.

## Inflated expectations

Even so, he said, the expectations of the regionals for this market may be inflated. Chicago-based Ameritech, for example, said it believes the regional market for its kind of information systems solutions will reach the \$600 million ballpark by 1992. "Traditional systems companies have taken maybe 20 years to get there," Peterson said.

The leader of the pack, Peterson and others said, is Nynex Corp.'s AGS Information Service, Inc. The \$200 million systems integrator became a wholly owned subsidiary of New York-based Nynex in October 1988.

Sue Luster, senior vice-president at the Mountainside, N.J., firm, said Nynex has wisely followed a hands-off management approach, letting AGS pursue its specialties in banking, manufacturing and utility firms.

"[The Nynex name] has assisted us in opening doors," Luster added, noting that AGS can and has collaborated with other nonregulated Nynex subsidiaries in jobs for its 300 or so customers.

Meanwhile, the peculiar regulatory restraints that bind their parent corporations mean these integrators must tiptoe around certain subjects. While they can build two local-area networks, for instance, they are prohibited from constructing the long-distance connection between them or even from recommending a long-distance provider.

In the case of AGS, the company was forced to spin off its manufacturing arm at the time of the Nynex purchase. In addition, like all the other regional Bell holding company-owned integrators, it is prohibited from doing facility management for customers, such as running a network management or data processing center.

Under the Modified Final Judgment that broke up Bell System in 1984, the regionals cannot manufacture equipment, process information (although a recent ruling allows them to transport it) or provide long-distance services.

When it comes to questions about complying with the Modified Final Judgment prohibitions, Luster concluded, "We have a policy: 'If in doubt, shout.'"

Last July, Philadelphia-based Bell Atlantic Corp. founded Bell Atlantic Systems Integration Co., acquiring Arlington, Va.-

based American Management Systems.

According to Executive Vice-President Al Smith, the move was necessary because Ameritech was trying to capture the broader needs of Bell Atlantic's customers. "They have a very large client base with a lot of information needs that go beyond basic voice," said Smith, a former American Management Systems executive.



The unit, now with 10 customers, will concentrate on imaging, network integration and interoperability and public safety systems, Smith said, adding that his company hopes to generate about \$6 million in revenue this year and \$50 million within the next four years.

Smith said regional Bell holding companies can logically pursue IS jobs "because most have large, sophisticated departments." However, he added, most lack a knowledge of vertical industries — the special needs of a hospital, an insurance company or a bank, for instance.

"By and large, we're not in that business," said Dave Reberry, vice-president of systems engineering and development at US West Advanced Technologies.

The US West unit, founded in 1985, was established to serve the information and systems integration needs of US West. "I think we would suffer a little as a [systems integration] supplier until we demonstrate more internal usage," Reberry said.

US West and other regionals, he said, are undergoing a common migration toward more flexible, enterprisewide information systems.

For Chicago-based Ameritech Information Systems, Inc., a partnership with Ottawa-based systems integrator SHL Systemhouse, Inc. provided an entry point into the market. Ameritech began working with SHL in January 1988, a relationship that was continued a year later when Ameritech Information Systems was formed.

"Early on, SHL wrote the proposals," Ameritech Information Systems Vice-President of Marketing Stephen R. Nelson said. "This year, more than half of the proposals were designed and written by Ameritech people."

The Indianapolis Metropolitan Communications Agency is using the Ameritech subsidiary to design and install a \$25 million countywide radio and computer-aided emergency dispatch system. The system will work in conjunction with a \$10 million enhanced 911 system being provided by Indiana Bell.

However, the fact that both parts of the project come from Ameritech subsidiaries — one a systems integrator, one a phone company — "had nothing to do with our choice," said Deputy Director for Operations and Administration Jack Spriggs, who added that he selected the systems integration proposal on its own merits.

## INTERNATIONAL BRIEFS

### Free for all

The issue is still evolving through court decisions in the U.S., but pro-software interface copyright forces in Europe were disappointed last week. The **European Economic Community** said no to copyright protection for interface software with a draft by the European Parliament of a uniform software copyright law that contains a specific exclusion of program interfaces.

### Lapping up the market

Next year, Tokyo-based **Nippon Steel Corp.** will be bringing a laptop or notebook-size computer to market, the firm said. When the first of the lines — most likely the laptop — hits the shelf, it could make its manufacturer the first Japanese steel firm to enter that market. If Nippon realizes its expectations, the launch will also boost the firm's computer division to fiscal 1993 sales in the \$1.8 billion ballpark.

### Sharing

It is not unusual for a growing young firm to go public; it is, however, if the firm in question is one in which **IBM** holds a stake. Nevertheless, officials at **IBM Japan Ltd.** said IBM has given a green light to **Japan Business Corp. (JBC)** to offer its shares in Japan's over-the-counter market. IBM currently owns 35% of JBC.

## Apple

FROM PAGE 83

to have escaped much of the cost-cutting that trimmed U.S. operations earlier this year.

"We were not impacted by the [cost-cutting] measures," De Luca said. "I don't see that happening here."

Apple Europe has also been shielded from the low-end product vacuum that has sucked away a lot of Apple's original low-end market in the U.S., said Dan Byrne, director of European operations.

"We're less vulnerable to not having something at the low end" because Europe has never been as big a market for low-end machines as the U.S., he said. "Many countries have never even marketed the Apple II."

## Adding European spice to Apple

**C**an a dose of imported European mind-set help turn things around at struggling Apple? Observers said that new Chief Operating Officer Michael Spindler should be able to transplant some winning strategies across the Atlantic. But even Apple executives pointed out that the former Apple Europe chief will find more than an ocean separating the U.S. and European markets.

Spindler brings to the U.S. a perspective of market differentiation he acquired dealing with the diverse nations of Europe. This will serve him well in the U.S., which presents its own market diversity in the form of corporate, education and home markets.

"In part, Spindler is the right guy for the job because he's used to localizing Apple's selling and marketing strategies across Europe," said Peter Rogers, an analyst at Robertson, Stephens & Co. in San Francisco.

Part of Spindler's job will be to pull the corporate organization together, something he has already effected in the European organization, according to Apple Europe marketing director Guerrino De Luca. However, Spindler cannot expect to find his new territo-

ry a mirror image of Europe. "What is good for us is not good in the U.S.," said Jean Calmon, director of strategic business development at Apple Europe.

One of the key differences is the dealer channel and customer makeup. Apple Europe has a close network of loyal dealers in Europe, including the highly successful Apple Centers that sell nothing but Apple products. The formula works well for the European buyer, who requires more services and guidance from dealers.

In the more mature U.S. market, however, customers are concerned with price and do not need the hand-holding that Apple Centers provide, Calmon said. Though Apple U.S.A. is reportedly considering the establishment of its own Apple Centers, "it's a concept that will be difficult to implement," he predicted.

Some analysts agreed. U.S. customers "like to go to a dealer that can offer them multivendor solutions," said Eric Zimits, an analyst at Rauscher Pierce Refsnes in Dallas. "I'm not sure [Apple Centers] will work over here."

RICHARD PASTORE





# Here's your chance to ta

**With our new  
ACCUMASTER® Services Workstation,  
you can reconfigure your AT&T 800 Service,  
SDN or ACCUNET® Digital Services  
networks without any help from us.**

If you're an AT&T customer, you could be in a position of real power: sitting in front of the new ACCUMASTER Services Workstation.

The ACCUMASTER Services Workstation is an enhanced-graphics terminal with so much capability it lets you recon-

figure your AT&T traffic any way you want, to reroute around trouble and juggle heavy volume.

Say you have a flood of 800 calls going through your Northeast telemarketing center when a real flood causes your PBX to go down. Just by clicking your mouse, you can redirect 70% of the endangered calls to your West Coast center and the remaining 30% to your Midwest. (Or whatever split you decide on.) Without any help from us, you just saved your company valuable 800 calls that might otherwise have been lost.

Here's something else the ACCUMASTER Services



# Take total control of AT&T.

Workstation can save you. Money. By letting you consolidate your existing and future services into a single workstation, it cuts down on the equipment you need to run your network.

So if you'd like to manage your network more effectively, give us a call. By letting you control a piece of our business, we can probably help you run yours better.

***Network Control. Another AT&T advantage.***

For more information on the ACCUMASTER Services Workstation, call your AT&T Account Executive or 1800 NET-MGMT.



**AT&T**

The right choice.

# Homegrown technology passed over Down Under

BY PETER YOUNG  
SPECIAL TO CW

SYDNEY, Australia — A New South Wales government authority has rejected a terminal designed and made in Australia in favor of a similarly priced, fully imported terminal.

Bull HN Information Systems, Inc., which is backing the Australian terminal, said it is so angered by the decision that it plans to reassess its participation in the Partnership for Development Program (PDP).

The terminals were being considered by the New South Wales Roads and Traf-

fic Authority (RTA) as part of a \$2.35 million to \$3.9 million upgrade of its registry offices. The new machines passed technical tests with flying colors, according to several sources, but the RTA recommended that the order for 1,500 units be placed with either Italy's Ing. C. Olivetti & Co. or U.S.-based NCR Corp. Neither company has plants in Australia, so presumably their terminals would have to come in from overseas.

Bull HN general manager Graham Moore said the decision made a mockery of the PDP, of which his company was the first member.

"This was an example of how things

were supposed to work under the program," he said. "ARDC, the Brisbane-based company making the terminals, is a small, battling Australian operation with an innovative product. At considerable expense, we put in the resources to validate it and make it a reliable world-class product. But in the end, RTA told Bull it considered the Australian terminal 'too risky.'"

The decision was made the same week as the first units began rolling off the production line in Bull's North Ryde plant, which has been certified by both Standards Australia and Telecom.



"The government hasn't met its side of the bargain," Moore claimed. "How can I go to my parent company and convince them to pick up a product if an Australian state government isn't even willing to pick it up?"

Geoff Deacon, director of registration and licensing for the RTA, said the ARDC terminals have a bright future. However, they formed only one part of the integrated point-of-sale systems going into the RTA's 137 registry offices, he said. Other components included optical character recognition and printers connected to Fujitsu Ltd. systems based on Intel Corp. 80386 chips.

In addition, the ARDC system existed only in prototype form until recently, and the RTA project called for all offices to go on-line simultaneously in real time by February 1991.

"Looking at that time frame, there were risks. Combined with that, Bull did not have as good an overall proposal as other companies," Deacon said. He confirmed that a final recommendation has been made on the project, but that contract negotiations with the chosen supplier have not yet been finalized.

*Young is Queensland editor at Computerworld Australia.*

## With Chipcom, all you need to reconfigure your network



## is this simple tool.

Managing your company's network just got easier. Chipcom's ONline System Concentrator™ gives you a totally new dimension in freedom and flexibility for configuring and reconfiguring large, complex networks.

The unique TriChannel™ architecture of ONline supports not just one, but up to three separate Ethernets. Or any combination of Ethernet, Token Ring and FDDI networks. All at the same time, and all within a single ONline concentrator.

Integrated bridging and routing, and a sophisticated network management system allow moves, adds and changes to be made with fingertip ease.

Someday, perhaps, all networks will be as reliable, easy to manage and flexible as Chipcom's.

But for now, no one else can lay a finger on us.

For more information, call 1-800-228-9930.



# CHIPCOM™

Networking as it will be.

GSA# GS00K90AGS5185

## NATIONAL BRIEFS

### Executive shuffle

An executive reorganization at Mips Computer Systems, Inc. — aimed, according to Mips, at positioning the Sunnyvale, Calif.-based reduced instruction set computing pioneer to break the \$1 billion barrier before the decade's end — last week put former Apple Computer, Inc. executive **Charles Boesenberg** in the president's office. With the new president concentrating on customer-related issues, Chairman and Chief Executive Officer **Robert Miller** said he will focus on the strategic/competitive/technical side of the business. Looking out (and out looking) for strategic allies will be former Executive Vice-President of Field Operations **William Jobe** — as of last week, president of the newly formed Mips Technology Development Group.

### Like parent, like sub

Norristown, Pa.-based computer maintenance vendor **Granada Computer Services, Inc.**'s recent acquisition of React Corp., a \$10 million maintenance firm in Menlo Park, Calif., extends the acquirer's presence into 50 U.S. cities and some 1,000 customer sites. Granada's president said that he was pleased; so, no doubt, is \$2.5 billion UK conglomerate **Granada Group PLC**, which owns not only the Norristown firm's British parent but also Granada Computer Services International, reputed to be Europe's largest independent computer maintenance firm.

# COMPUTER CAREERS

## Is integration all it seems?

*A boon to excellent managers may be a threat to corporate also-rans*

BY CHRISTOPHER LINDQUIST  
CW STAFF

In the private sector, the U.S. systems integration business will grow at a compounded rate of 29% per year through 1994, according to a study by market research firm Input, Inc. In the government arena, systems integration will grow 17% per year, the company says. Worldwide, the overall growth should come in at 24% per year.

The future certainly looks rosy for systems integrators. But will the industry's growth create a booming demand for information systems professionals? Not necessarily.

Companies are hiring systems integrators to improve the efficiency and connectivity of their information systems. As a result, they will expect to get by with fewer IS professionals on staff, says Jay Gaines, an executive recruiter in New York. Integrators will be hiring, but they will also be displacing IS professionals employed in-house today.

"To the degree that systems integration is successful, it probably means that there are going to be fewer overall jobs," Gaines says. Growth of systems integration will eliminate opportunities for "marginal" IS professionals. Middle managers who made it to

their positions without distinguishing themselves will bear the brunt of the cutbacks, he adds.

Not everyone totally agrees. That scenario may unfold but not anytime soon, says Ed Hogan, a managing associate at the consulting firm Coopers & Lybrand, based in Washington, D.C. IS staffs will keep busy with day-to-day maintenance and operations, Hogan says. Furthermore, systems integration projects may even add a little to the head count at corporate IS organizations rather than reducing it as firms hire people to take care of new applications.

Don't expect the growth of systems integration to lead to the creation of a lot of start-up companies either, says Len Doherty, vice-president of Gustin Partners, an executive search firm specializing in the field. The jobs that systems integrators create will tend to be at big, established players such as Computer Sciences Corp. and Andersen Consulting, he says.

The firms that will be prime players are already established because of the deep pockets it takes to finance the business,

Doherty says. Executives at some integrators are already having second thoughts about the business because profit margins are slimmer than expected, he says: "The bloom is off the rose. While systems integration is a natural evolution of the industry, it is not a field for small players."

IS professionals who would like to update their resumes to get in sync with the systems integration trend would be wise to consider the requirements of specific firms. "I've seen a lot of mismatches," according to Doug Aldrich, a vice-president at Booz, Allen & Hamilton, Inc., a New York-based consulting firm that has branched into systems integration.

People should find an integrator whose methods match their own, he says. In general, systems integration people must be more flexible than corporate IS professionals, Aldrich adds. They must focus on delivering a working system on schedule rather than on controls and procedures, even when it means bending rules or cutting corners.

A recent survey of systems integration executives by the

trade association Adapso identified skills that systems integrators look for in employees.

The executives pointed to project management as the most critical skill: One-third cited it as the most essential one for their business. They said that lack of systems integration manage-

Aldrich adds.

Other skills identified in the Adapso survey include the following:

- Knowledge of systems design and architecture.
- Software requirements analysis — the ability to work with users in determining software fea-

**G**ROWTH OF SYSTEMS integration will eliminate opportunities for "marginal" IS professionals. Middle managers who made it to their positions without distinguishing themselves will bear the brunt of the cutbacks.

JAY GAINES  
EXECUTIVE RECRUITER

ment skills is the leading reason for refusing to take on a project.

A good project manager can plan, organize and control systems integration projects, extracting the best performance from numerous groups with help from "a large portion of people skills," Hogan says.

Some integrators like to see people with project management experience who can hit the ground running, Aldrich says. Others, however, prefer to take people directly out of college — they find experienced IS people have to "unlearn" inappropriate methods. Such employers usually provide extensive training for their recruits.

People with a master's degree in business are often very valuable to systems integrators,

tures and functions.

- Personal communication — reading, writing, speaking and listening skills.

Integrators are also keen on people who understand a particular client's business, especially as they seek to forge long-term relationships with their customers. Companies hire people to work under a specific contract after identifying the skills the contract will call for, such as knowledge of banking or manufacturing, Doherty says.

There are many industries that interest integrators, Aldrich says. "It is not important what business you know, as long as you get one and get good at it."

Lindquist is a *Computerworld* copy editor.

**RCG/PRO-ACCESS, INC.**  
1900 North Loop West, Suite 200  
Houston, Texas 77018

A premier contract/consulting firm is searching for

### Technical Consultants

who would like to net 75 to 80% of the billing rate.

Positions exist in Texas, Oklahoma and Saudi Arabia.

- DB2, TELON
- DB2, CSP
- DB2, CICS
- SQL/DS
- ORACLE
- PCS/ADS
- Series 1, RPS
- AS400, RPGIII, SYNON
- IMS, COBOL, PL1
- ADABAS NATURAL
- MSA PACKAGES
- SYS. PROGRAMMERS
- PC LAN'S, 3-COM
- Seismic, Fortran

**1-800-877-5383**

FAX-713-956-1705

NACCB Member



### Computer Power Group

the difference is Quality

COMPUTER POWER GROUP provides a broad range of computer consulting services to companies. With 80 offices on four continents, we have built a solid reputation for technical excellence and quality performance. CPG is committed to our employees. We offer superior assignments, growth and learning opportunities. CPG is seeking experienced programmer analysts; find a career with us!

120 Montgomery St. #1560  
San Francisco, CA 94104  
Call Christopher Olsen  
(415) 391-0365  
Fax: (415) 391-2055

5110 North 40th St.  
Phoenix, AZ 85018  
Call: Given or Star  
(800) 926-7635  
Fax: (602) 957-8254

**SYS/Analyst**  
-65k+ ..... IMMED. Interview  
In Manhattan

### AS-400 6PC's

5+ years business exp.  
Highly visible spot

Call Bob or send resume to  
(212) 944-9250

### Exec Computer

1440 Bway Suite - 1652  
NYC, 10018  
or FAX (212)869-2846

RSVP SERVICES

ANALYSTS • PROGRAMMERS • HW/SW

### In a Slow Market, You Need A Quick Employment Service

If you have marketable skills, together with reasonable geographic and salary requirements, your resume will be on its way selectively, to our applicable contacts among our 1000+ client companies and 200+ affiliates nationwide, **within 24 hours after we receive it.** No cost or obligation to you; no sales pressure.

Our clients seek 2 years minimum professional experience, stable work history, good technical references, and U.S. citizenship or green card.

TO APPLY: Mail or FAX resume or call Howard Levin.

### RSVP SERVICES

Dept. C, Suite 614, One Cherry Hill Mall, Cherry Hill, NJ 08002  
800-222-0153 or FAX: 609-667-2606 (refer to Dept. C)

## INFORMATION TECHNOLOGY

### Management Consulting

**Ernst & Young** is one of the most successful management consulting firms in the U.S. and we are currently expanding our Information Technology Group "Nationally". This is an excellent opportunity for data processing professionals at all levels to expand their skill sets.

Ideal candidates will be highly qualified and experienced Information Systems Professionals in an IBM systems building environment.

Related experience should include:

#### Database

IMS  
IDMS  
DB2  
ADABAS

#### Language

COBOL  
PL/I  
BAL  
4GL  
FOCUS  
RPG 400

#### Positions

PROGRAMMERS  
PROGRAMMERS/  
ANALYSTS  
Project Leaders/Managers  
DBA's

#### Application

Retail  
Manufacturing  
Oil and Gas  
Banking  
Government

#### Other Experience

CASE TOOLS (IEW/IEF)  
Information Engineering  
Full life-cycle system  
development

Positions available nationally.

Prior consulting experience is a definite plus.

Contact or mail resume to **Thomas E. Wagner, National Director MCHR**, 2000 National City Center, Cleveland, Ohio 44114.

**Ernst & Young**

An equal opportunity employer, M/F

## DATA PROCESSING PROFESSIONALS



## PUT YOURSELF ON THE MAP

We're Computer Horizons, the company renowned for helping some of the most prestigious Fortune 500 companies make efficient use of their data processing and computer systems. Within each of our eight regions, our expertise in sophisticated custom software development, systems integration, training and education, has provided a solid base in information consulting from which we are now growing into management consulting.

Recent strategic alliances with major firms are opening challenging long-term projects to us and are elevating our name to a new level of consciousness within the industry. Joining our staff of innovators can do the same for you.

If you're qualified, we offer real opportunities to use your talent on projects that will excite you and tax your abilities. Openings are now available that require design or implementation experience in one of the following:

- OS/2
- UNIX
- MS/DOS
- DB/2
- Windows 3
- HP3000
- COBOL/MVS
- PL/1
- Informix
- Oracle
- IEW

In addition to the pace and challenge of our world-class environment, you'll enjoy above average salaries and a superior benefits package that includes health, life, dental and disability insurance, unlimited tuition refund, a deferred income savings plan, relocation assistance and exceptional room for growth.

Add a new dimension to your world... come to Computer Horizons. For prompt consideration, call, Fax or forward your resume to: Attn: Recruiting Department. In N.J. call (201) 402-7400, outside of N.J. call 800-321-2421. COMPUTER HORIZONS CORP., 49 Old Bloomfield Avenue, Mountain Lakes, NJ 07046-1495. Fax (201) 402-7986.



**COMPUTER HORIZONS CORP.**

An Equal Opportunity Employer M/F

"The Solution Experts"

## DATA PROCESSING

## CAREER OPPORTUNITIES FOR SYSTEMS PROFESSIONALS

Sverdrup Technology, Inc., a subsidiary of Sverdrup Corporation, provides technical, scientific and engineering services to NASA and other resident agencies of the Stennis Space Center. The following opportunities are with our Data Services Department:

### IBM SYSTEMS PROGRAMMER

Seeking a highly motivated senior IBM Systems Programmer to handle technical support, system design, planning and maintenance in growing 4381 and 3090 arena. Thorough knowledge of MVS, CICS, TSO, VTAM, ACF-II environment necessary. Degree in Computer Science or Electrical Engineering required.

### VAX SYSTEMS PROGRAMMER

Requires a minimum 5+ years experience

**Sverdrup**  
SVERDRUP TECHNOLOGY, INC.

with VAX/VMS systems management. Duties include technical support, system design, planning and maintenance. Degree in Computer Science or Electrical Engineering required.

### DATA BASE ADMINISTRATOR

Primary responsibilities include maintenance and performance tuning of ADABAS/NATURAL in MVS/CICS environment. Qualifications include a BS in Computer Science and 3+ years experience in ADABAS administration.

Sverdrup Technology, Inc. is dedicated to technical excellence and offers a competitive benefits program. These opportunities are located at the Stennis Space Center, near New Orleans, and only minutes away from the Mississippi Gulf Coast. Interested candidates should submit resume and salary requirements to: Sverdrup Technology, Inc., Human Resources Office, Dept. BS036, Bldg. 1103-CW, Stennis Space Center, MS 39529. Equal Opportunity Employer. U.S. Citizenship may be required.

## MVS/VM INTERNALS EXPERTS

1990 SYSTEMS SOFTWARE DEV. CO. MAJOR INTERNATIONAL EXPANSION • \$45K-\$210 • SIGN-ON BONUS • STOCK OPTIONS • FULL RELOCATION • FLEX-TIME • SPORTS CLUB • PRIVATE OFFICE • 401K RELAXED ENVIRONMENT AND ATTIRE

### PRESIDENT

V.P. SUPPORT OR DEV. OR MARKETING & SALES

SYSTEMS SOFTWARE DEVELOPERS & SYSTEMS ENGINEERS

The majority of S/W devel. is done in So. Cal. However, a major Nationwide & International expansion as well as the possibility to "TELE-COMMUTE" FROM HOME part time are all in the plans for 1990. We are seeking several experts with 3 yrs RE-ENTRANT BAL & MVS. VTAM, DB2 or CICS INTERNALS to help Design, Install or Support the New 1990's Systems S/W Product lines. Several traveling positions exist for instructors to live anywhere in the USA & TEACH CICS or DB2 Perf. Tuning & DataBase Design.

DB2, VTAM, CICS or VM INTERNALS • RE-ENTRANT BAL • VTAM APPS • "C" • 3270 LINE CODE AUTOMATED OPERATIONS • NETWORKING • DBMS ARTIFICIAL INTELLIGENCE

California • New York • Washington • Virginia • Colorado • Japan

### CALL RICK DEANS TODAY

213-276-6339 FAX 658-1599  
9100 WILSHIRE BLVD #442 BEVERLY HILLS, CA 90212

**Senior Systems Analyst** for steel processing company in NE Ohio to supervise the installation of new computer system, maintain an 80386-based super microcomputer using a UNIX operating system, evaluating and determining the company's information systems requirements including selection of appropriate hardware & software, provide technical instruction and assistance to system users, train personnel in all aspects of the computer system, manage & coordinate computer systems & uses and prepare necessary and desirable computer management reports, statistics & other accounting data which ultimately is used by management in decision-making. No exp. required in above duties, but applicants will qualify with MBA in Information Systems; 1 yr. exp. in programming using UNIX operating system; conducting feasibility studies; training users & programming using management software packages, which packages must include programs for business shipping, inventory, cash flow, accounts receivable, accounts payable, general ledger, purchasing, financial reporting. Experience may be gained simultaneously & programming experience may be gained in school. 40 hrs/wk, 8:30 am-5:30 pm, \$38,000/yr. Must have proof of legal authority to work permanently in U.S. Send resume in duplicate (no calls) to J. Davies, JO#1084579, Ohio Bureau of Employment Services, P.O. Box 1618, Columbus, OH 43216.

## PROGRAMMERS/CONSULTANTS

LENCO COMPUTER CONSULTING is currently recruiting Consultants and Full Time personnel with skills in the following areas:

- MEDICAID (P/A's and Proposal Writers)
- COBOL, CICS, IMS
- AS/400, SYS 36, 38
- ORACLE, SYBASE, DB2
- IDMS/ADSO, VAX, RDB

Please call or FAX resume to:



THE LENCO PRO  
Computer Consultants  
318 Bear Hill Rd, Suite 2  
Waltham, MA 02154  
617-890-7555  
617-890-0904 (fax)

**Prog./Analyst**  
**IMMED. Interview**  
**Salary- MID 50's**

**OS/MVS COBOL**  
**MSA A/P G/L**

Minimum 2 years MSA  
A/P G/L is expected

Call Bob or send resume to  
(212) 944-9250  
**Exec Computer**  
1440 Bway Suite 1652  
NYC 10018  
or FAX resume (212) 869-2846.

**UNIVERSITY OF ALASKA FAIRBANKS**  
**Director of Administrative Computing Department**

The Director is responsible for developing future equipment needs, system design & staffing requirements to provide administrative computing services to UAF, manage installed computer hardware (HP 9000/835, Wang VS/7120) and systems; direct systems development projects. Req's: technical knowledge & work experience with computer networking, including minicomputers; contemporary software tools (Unix, SQL DBMS, COBOL-85, C, Eiffel OOP); distributed processing. Minimum 10 years increasingly progressive responsibility in computer management (appropriate education may be substituted). Salary is DOE. Closing date 31 August 1990. Send resume, three references & other supporting material to Employee Relations, Eielson Bldg., UAF, Fairbanks, AK 99775. UAF is EO/AA EMPLOYER & EDUCATIONAL INSTITUTION.

## SYSTEMS

**Data Base Analyst** .....  
..... **IMMED. Need**  
..... **In Manhattan**

## IDMS-DBA

2 years exp. as DBA is okay  
Major Bank

Call Bob or send resume to  
(212) 944-9250  
**Exec Computer**  
1440 Bway Suite -1652  
NYC 10018  
or FAX (212) 869-2846

Computer Applications Engineer to research and develop advanced computer algorithms and software for complex mechanical computer aided design (CAD), computer aided manufacturing (CAM), and numerical controlled machines. Develop computer graphics and systems integration application. Provide applications engineering and technical support on complex mechanical design and manufacturing processes and methods in connection with computer systems and software. Instruct users. Must have Master of Science degree in Mechanical Engineering with three years experience as Assistant Engineer. Graduate level coursework must include one of each of the following: Computer Aided Manufacturing; Artificial Intelligence; Database Systems; Computer Graphics. Master's level thesis must be in the general area of application of artificial intelligence software techniques in computer integrated manufacturing systems. Experience must include development of computer software with computer graphics for CAD applications. Salary \$43,316 per year, 40-hour week. Please send resumes to 7310 Woodward Avenue, Room 415, Detroit, Michigan 48202. Reference No. 46890. Employer paid ad.

### PROGRAMMER ANALYST B

Programmer Analyst B needed to analyze and evaluate the concept of an automated credit card verification system using a network communication carrier in a real time environment. Design data transmission programs capable of networking functions. Design, develop and implement system backup procedures. Design and develop the system for communication with the PC to the mainframe using LAN. Test, trouble-shoot and implement the system. Make recommendations to management regarding specifications and descriptions of proposed financial projects and systems. Prepare instruction manuals. Design financial packages for clients to include debit, credit, accounting and marketing systems. Requires a Bachelor's Degree in Computer Science/Management Information Systems or its equivalent. With degree, requires six months education or experience in C language and RDBMS in a UNIX environment. If no degree, requires at least three years C language experience as well as one year RDBMS in a UNIX environment. 37.5 hour work week. \$31,000.00 per year. Apply at the Texas Employment Commission, Ft. Worth, Texas, or send resume to the Texas Employment Commission, TEC Building, Austin, Texas 78778. Job Order #6122813. Ad paid for by an Equal Employment Opportunity Employer.

## PROGRAMMER/ANALYSTS

Leading EDP consulting company is offering long term and challenging positions on Long Island for professionals with strong skills in any of the following areas:

- WANG/VS100 SYS. PROG.
- COBOL/CICS
- TESSERACT (HRMS)
- DB2 • SAS • PL/1
- MVS- ORACLE W/CICS A+
- ADABAS/NATURAL 2
- MANTIS • INGRES

We offer excellent salary & company benefits. Contact or send resume to:  
Nancy Zadrozny

**CORNELL COMPUTER CORP.**  
125 EAST BETHPAGE ROAD  
PLAINVIEW, NY 11803  
516-420-5000 FAX: 5068  
An Equal Opportunity Employer M/F

## Sunbelt Opportunities

AS/400 - S/38 Prog/Anal's	30-37K
DB2/SOL Prog/Anal's	30-40K
MSA or M&D Prog/Anal's	33-40K
CICS Prog/Anal's	30-36K
TANDEM Prog/Anal's	30-38K
UNIVAC 1100 Prog/Anal's	30-35K
ADABAS/NAT Prog/Anal's	30-36K
DATACOM/IDEAL Prog/Anal's	30-35K
HP 3000-CDBOL Prog/Anal's	30-35K
ORACLE-SQL Prog/Anal's	30-39K
VAX/CDBOL Prog/Anal's	32-36K
FOCUS Prog/Anal's	29-35K
IDMS/ADSD Prog/Anal's	29-35K
ASSEMBLER Prog/Anal's	29-34K
EDP Auditors	33-43K

North Carolina's largest employment agency, in business since 1975, 300 affiliates. Opportunities in the South-east and nationwide.

**Corporate Personnel Consultants**

3705-320 Latrobe Drive, Box 221739  
Charlotte, NC 28222 (704) 366-1800  
Attn: Rick Young, C.P.C.

## CA & AZ CONTRACTS

## CONSULTANTS WANTED



P. Murphy & Associates, Inc.  
4405 RIVERSIDE DRIVE, SUITE 100  
BURBANK, CA 91505  
(818) 841-2002 (714) 552-0506  
FAX: (818) 841-2122

## TANDEM FLORIDA CAREERS

You can have a Florida lifestyle without sacrificing your career accomplishments

Call or send resume to  
12225 28th Street North  
St Petersburg FL 33716  
813-573-2626  
800-888-1064

**COMPUTERPEOPLE**  
"Florida's Leading Consulting Firm"



## SAN FRANCISCO BAY AREA

Please make note... Our clients have new and exciting openings with the following skills:

- ALC Developers for IBM operating system components; MVS, DB2, IMS, VTAM
- ORACLE Applications programmers, designers, data base development
- C/UNIX Programmers, Systems Administrators
- AS-400 Programmers, Analysts

## THE SEARCH FIRM, INC.

595 MARKET STREET, SUITE 1400, SAN FRANCISCO, CA 94105  
(415) 777-3900 FAX 777-8632

## HOGAN

We have over 50 job openings in the HOGAN (TDA DDA, CIS, RPM) + CPCS, MICR & other banking software applications at 30 different locations all over the U.S. Our clients pay our fees.

**JOHN BERRY**  
**PERSONNEL CONSULTANTS**  
1205 Coliseum Dr.  
Winston-Salem, NC 27106

919-725-8555  
8am - 10pm 7 days/week  
FAX (919) 777-0059 24 hrs/day

## BANKING

## Senior Technical Training Specialist

As a Senior Technical Training Specialist, you will provide technical training support in the analysis, development, delivery and evaluation of courseware for data processing professionals of the Information and Telecommunications Division. Opportunities are currently available in three locations: LOC1 = Colorado Springs, LOC2 = Memphis, and LOC3 = Los Angeles.

To qualify for this position, you must have a Bachelor's degree/equivalent, 6 years experience in software development which includes 2 years technical training experience in the analysis, development and delivery of software technical training resources; and the ability to perform as a "Technical Lead" on major training development projects. Strong human relations and communications skills and at least two years of experience in an IMS environment are also necessary.

We offer an excellent salary and comprehensive benefits package, and the chance to work for one of the top ten companies in America. To apply for this career opportunity, please send your resume, referencing the appropriate location number, to: **Federal Express Corporation, Data Center, 5550 Tech Center Drive, Colorado Springs, CO 80919, Attention: ALN.**



An Equal Opportunity Employer M/F/H/V



STATE OF  
MAINE



If you like to work hard and play hard, come to Maine: "the way life should be".

Recreational opportunities include sailing, camping, canoeing, fishing, hunting and skiing.

These recreational opportunities can be yours along with a competitive salary and a comprehensive benefits package if you are willing to accept one of the following career opportunities:

**SYSTEMS GROUP MANAGER (017000)** will manage the implementation and operation of a comprehensive new tax administration information system. The operating system is CICS/DB2 in a multi-platform environment. A significant portion of the system development will be contracted. (\$34,600 - \$48,200)

**SYSTEMS TEAM LEADER (086800)** will supervise a staff of Systems Analysts and Programmers, monitor contract work and perform advanced design and programming work. (\$33,200 - \$46,300)

**DATABASE ADMINISTRATOR (018900)** will have responsibility for maintenance and enhancement of the Bureau of Taxation's relational database. (\$34,400 - \$47,300)

To be considered for these new positions, applications must be received by September 4, 1990

For an application, supplemental questionnaire and further information, please contact:

Chuck Bunton  
Bureau of Human Resources  
State House Station #4  
Augusta, Maine 04333  
(207) 289-4418  
FAX: 289-4563

AN EQUAL OPPORTUNITY EMPLOYER

# BUSINESS SYSTEMS ANALYSTS

APPLICATION ARCHITECTURE & DATABASE ADMINISTRATION

DB2 • Teradata • Ingres • AS/400 - CHICAGO

## Plan Your Escape



As a \$23 billion, Fortune 50 corporation with operations in 140 countries, Kraft General Foods is the largest U.S. based international food company. Our Information Systems Group is reshaping and reengineering the way our business operates and competes.

This environment isn't for everyone. We will expect you to be something of a visionary, and capable of providing business solutions, not just technical options. If you have expertise in the following areas and a Bachelor's degree in Business, Computer Science or Information Systems, let us hear from you.

### APPLICATION ARCHITECTURE

The Application Architecture Group will provide the technical leadership to get Kraft General Foods from a centralized to a distributed environment. Your responsibilities will include the implementation of application architecture, reviewing and recommending new business systems development tools, performing quality control reviews, recommending enhancements to installed-base applications, developing the multi-platform messaging facility, as well as the standards for distributed data processing.

Qualified candidates must possess a minimum of 5 years' systems development experience including 2 years in a distributed processing environment. In addition, you should have a working knowledge of IBM SNA communications, a minimum of 3 years' experience coding APPC programs in an AS/400 or MVS/CICS environment, and at least 2 years' relational database environment experience. A background in PU 2.1 communications, PS/2 based APPC development and/or HP UNIX is preferred.

### DATABASE TECHNICAL

We're dedicated to building the most sophisticated database environment in the industry. Qualified Information Systems professionals will play a key role in the development of DB2 for Order Management and Human Resources applications, Ingres for the Plant Floor and AS/400 for Distribution and Manufacturing. Your technical skills must include a minimum of 2 years' experience in the design and installation of DB2, Teradata, Ingres or AS/400. A detailed working knowledge of software internals, relational database technology and software engineering/CASE Tools is essential.

### DATA DESIGN

As an integral part of our team, you must have at least 2 years' relational database experience and be familiar with data driven systems development. Experience utilizing CASE Tools, preferably IEW, in the support of data modelling techniques with Information engineering methodology is required.

To attract top talent we offer generous salaries and complete benefits, plus a business systems environment that could lead you beyond traditional technical ladders and into general management. Join us and make business history, and a name for yourself. To confidentially explore these opportunities, send your resume to: Nancy Mora, Kraft General Foods, Kraft Court, 4N, Glenview, IL 60025. We are an equal opportunity/affirmative action employer.

# KRAFT GENERAL FOODS

INNOVATING BEYOND THE EDGE. LEAVING TRADITION BEHIND.

## DB2 and CSP PROFESSIONALS

Amherst Information Systems, a national DB2 consulting company and IBM Business Partner, has immediate openings for DBA's and Application Developers in Washington, DC, Dallas, TX, New York State and other major cities throughout the U.S. Ideal candidates will possess a minimum of 5 years IBM Mainframe experience and any of the following:

- 2 years DB2
- 1 year CSP
- 3 years CICS

For confidential consideration in our employee-oriented company, please call collect or rush your resume to: Robert Smith,

**AMHERST INFORMATION SYSTEMS**

1110 North Glebe Road, Suite 1020  
Arlington, VA 22201  
(703) 525-3900

## SYSTEMS & PROGRAMMERS

One Project manager with knowledge of Optical Storage Max salary - Project Manager will be interfacing with the systems group utilizing MVS. Max to \$75K.

One IEW case Tool Technology - design and construction exp. is necessary. Max salary to \$60K.

Three TPF Programmers with exp. in maintenance or installation or systems service. Max to \$85K.

Call Bob or send resume to  
(212) 944-9250

**Exec Computer**  
1440 Bway Suite -1652  
NYC 10018  
or FAX (24hrs.) (212) 869-2846

## AS/400 S/38

### GET TO THE HART OF THE BUSINESS...

...With Whittman-Hart, the largest diversified technical services company (dedicated strictly to the AS/400 and S/38 systems) in the country. Providing technical support to many of the top Fortune 20 companies in America, we are the consulting experts, committed to mastering technologies, attending to details and creating solutions. Our accelerated growth and phenomenal success has created a need for talented Data Processing PROFESSIONALS to share in a future of significant challenge and reward in a highly progressive team environment.

We currently require individuals with 2+ years solid System 38, RPGIII, COBOL experience and proficiency in any of the following:

- Technical Consulting
- Design
- Education & Training
- Data Communications
- Project Management
- Product Development

**POSITIONS ARE CURRENTLY AVAILABLE IN CHICAGO, LOS ANGELES AND INDIANAPOLIS.**

Get to the HART of challenge and reward at Whittman-Hart. We offer one of the finest compensation packages in the industry, including high earning potential, project diversity, incentives, paid insurance coverage, relocation allowance and other impressive benefits. Please send your resume in strict confidence to: Jared Bobo, Director of Recruiting, Whittman-Hart, INC., 377 East Butterfield Road, Suite 425, Lombard, IL 60148. (708) 971-2270. Equal Opportunity Employer M/F.

**Whittman-Hart**

The Leader in the Midrange Solutions.

## PROJECT MANAGER

### Management Information Systems

Dartmouth College, a small liberal arts college in picturesque Hanover, NH, has a key position open for a Project Manager in Management Information Systems.

The project managers responsibilities include: systems' analysis of administrative functions of the college, design and implementation of new or replacement systems as well as installing, modifying, and maintaining vendor-provided software. The work will be primarily in the Medical School and financial areas.

Requirements include the following experience or the equivalent: a college degree preferably in computer science with knowledge of DEC's VMS operating system, programming experience in ORACLE, COBOL, PL/1 and similar languages; 6 years of experience in computer systems administration, supervision, systems analysis and/or project management and the ability to work well with senior managers such as Deans and Vice Presidents, as well as working-level personnel.

Review of applications will begin September 4, 1990 and will continue until the position is filled. Please send resume to Project Manager Search, Dartmouth College, 218 Clement West, Hanover, NH 03755.



## DARTMOUTH COLLEGE

An Affirmative Action/Equal Opportunity Employer. Minorities and Females are encouraged to apply.

Analysts, Programmers, Consultants

## Things Grow Fast... ...in the Right Environment!

Computer Management Sciences, Inc., a progressive employee owned software services corporation, is looking for top flight technical professionals. Due to the rapid growth of our organization across the United States and in Australia, many exciting career opportunities now exist for qualified ANALYSTS, PROGRAMMERS and CONSULTANTS. Your two or more years on-the-job experience with any of the following can lead to a long and rewarding career:

- |                  |                |
|------------------|----------------|
| ■ IMS DB/DC      | ■ PACBASE      |
| ■ IDMS/ADSO      | ■ REVELATION   |
| ■ DB2/SQL        | ■ ORACLE       |
| ■ ADABAS/NATURAL | ■ PROGRESS     |
| ■ DATACOM/IDEAL  | ■ SMARTSTAR    |
| ■ ASI            | ■ DEC/VAX      |
| ■ CAS 1.3        | ■ IBM MIDRANGE |
| ■ MSA            | ■ TANDEM       |
| ■ MANUFACTURING  | ■ TELEPHONY    |

C.M.S.I. offers one of the finest benefits packages in the industry, including relocation, health, dental, life insurance, profit sharing, 401K; excellent vacation and personal leave policies; educational assistance, employee stock plans and a bonus program keyed to your performance and contributions.

For immediate response, CALL 1-800-552-CMSI or RUSH your resume, in confidence, to: **COMPUTER MANAGEMENT SCIENCES, INC.**, Staffing Dept. CW 7/90, 8663 Baypine Road, Jacksonville, FL 32256.



Computer Management Sciences, Inc.

## Assistant Director for Computer Operations

### College Center For Library Automation (CCLA)

Tallahassee Community College (TCC) is accepting applications through Monday, August 13, 1990, for the position of Assistant Director For Computer Operations with the College Center For Library Automation, (a new statewide project established to acquire and implement a centralized integrated library automation system for the 28 Florida Community Colleges and their 60+ associated libraries - DRA software and DIGITAL hardware will be the basis of the system). The Central Computing facility will operate on a dedicated DEC 6000 series VAXCluster and utilize the Florida Information Resources Network (FIRN) X.25 Tymnet telecommunications system to connect the 900+ terminals located statewide envisioned for the system. Minimum salary \$40,000 (salary commensurate with training and experience). Applicants must submit a completed TCC employment application. Resumes are supplemental to the application. Applications must be postmarked no later than Saturday, August 11, 1990.

This position involves primary responsibility for the computer operations aspects of the CCLA. Responsibilities include working with DRA/DIGITAL relative to the installation of the central computer equipment, working in cooperation with FIRN staff to establish the statewide CCLA telecommunications system, developing a program and staffing for operation of the central computing facility, defining budget and staffing needs to carry out this program, and participating in the continuing planning efforts for future development of the system. Requires a bachelor's degree in Computer Sciences, at least three years experience with DEC computers, VAX/VMS experience, demonstrated planning, leadership, and management skills. Experience in a VAXCluster environment and X.25 or Tymnet telecommunications highly desirable.

Applications may be obtained from:  
Personnel Office - 100 Administration Building  
Tallahassee Community College  
444 Appleyard Drive  
Tallahassee, Florida 32304-2895  
(904) 488-9200, x204

Tallahassee Community College is an  
Equal Opportunity Affirmative Action Employer



BENSON, DOUGLAS  
& ASSOCIATES, INC.

## Computer Professionals

Are you interested in challenging, authoritative assignments? If so, our firm has immediate openings. We offer an exceptional benefits package that includes relocation fees, 401K, and profit sharing to name a few. If you have two or more years of experience in any of the following disciplines, we need you!

- IBM - TELON - 15 POSITIONS
- IBM-MVS/XA,CICS,VSAM
- IBM/PC-MS/DOS-C IMAGING SYSTEM
- STRATUS-(IBM88)
- AS/400 - RPG III, COBOL
- PDP TO VAX CONVERSION
- VAX/VMS-C
- VAX/SMARTSTAR
- VAX/INGRES - 6.0 (START-UP)
- HP3000,PROTOS,C,COBOL,MS/DOS-C
- HP3000,POWERHOUSE,JOBSCOPE
- HP3000,MRP/CUSTOMIZER,PASCAL,SPL
- TECHNICAL WRITERS, TRAINERS
- SOFTWARE TESTING, TEST PLANS, SCRIPTS
- ORACLE, INGRES, SYBASE
- SUN/UNIX, C - WINDOWS
- MACINTOSH - C
- VAX/SUN, UNIX - C

For immediate consideration call Jim Hash or Bill Hood at (919)467-3357 or (800)525-2927.

Resumes should be sent to:

113 Edinburgh So., Suite 104, Cary, NC 27511  
FAX# (919)467-7688.

An Equal Opportunity Employer

## MIS Programmer/Analyst

A Monsanto Company plant seeks an entry-level Programmer/Analyst to directly support the implementation of a Computer Integrated Enterprise plan in the process chemical manufacturing business. We require programming and PC applications experience (COBOL, 4 GL preferred). Network management, data communications, HP3000 and IBM OS JCL experience highly desirable. In addition, candidates should be customer-focused, capable of handling multiple responsibilities, and demonstrate initiative and willingness to learn. There is potential to move into applications development utilizing networking technology.

A B.S. degree in computer science or similar field is mandatory. Candidates with two or more years of experience would be considered very attractive.

The Nitro, WV, site is a progressive medium-sized plant (500 people) producing rubber, nutrition, and plasticizer products. The plant is located approximately 20 minutes west of Charleston, WV. We offer an excellent compensation/benefits package. Please forward resume in confidence to:

Ms. Shawn Patterson, Personnel Department  
One Monsanto Road, Nitro, WV 25143

An Equal Opportunity - Affirmative Action Employer M/F/H/V

## Monsanto

We challenge tomorrow, every day.

## PROGRAMMER/ANALYSTS

Metro has an excellent opportunity for you if you have experience with the following:

IDMS/R, ADS/O or IDMS/R DBA  
DB2

Metro offers excellent salaries and benefits, such as health, dental, life and disability insurance, cash bonus profit sharing, 401(k), technical skills training, and tuition assistance.

For immediate consideration, please call, FAX, or mail your resume to:

Marianne Ieni

P.O. Box 8888

Department 600CW

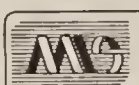
Virginia Beach, VA 23450

(804) 486-1700 / (804) 431-8215(FAX)

## METRO

Information Services, Inc.

EOE



## Resources

### International Inc.

Information Technology Consultants

## ANALYSTS / PROGRAMMERS

Opportunity to live and work in one of the most desirable and affordable growth areas in the country.

Resources International, Inc., headquartered in Atlanta, Georgia has 37 openings in the Southeast. We want to talk with you if you have over three years related software experience.

- |                   |          |          |              |
|-------------------|----------|----------|--------------|
| • FORTRAN         | • ORACLE | • SAS    | • AI-IN-1    |
| • MANTIS / ULTRA  | • RDB    | • FORMS  | • ULTRIX     |
| • WINDOWS         | • SQL    | • PASCAL | • SMARTSTAR  |
| • COBOL/DIBOL/RPG | • IDMS   | • DB2    | • IDMS/ADS/O |

WE OFFER COMPETITIVE SALARIES, PAID VACATION AND HOLIDAYS. TUITION REIMBURSEMENT AND COMPREHENSIVE MEDICAL BENEFITS.

Please send resume, call or FAX: Anne Perreyclear or Pete Wyatt  
570 Colonial Park Dr. • Suite 301 • Roswell, GA 30075  
Tel: 800-783-7468 (404) 594-7500 FAX (404) 587-1932

## COME AND JOIN US IN THE SUNNY SOUTH HOME OF THE 1994 SUPER BOWL.

### ATLANTA, GEORGIA

Who could ask for more? Magnificent climate for personal and professional growth, cosmopolitan Atlanta facilitates the lifestyle you want, while the Federal Reserve Bank offers state-of-the-art environment that is both **STABLE** and on the leading edge. We're looking for talented, experienced professionals to work in the following areas:

**AUDITING** EDP Auditor - Knowledge of MVS-IMS DB/DC, ACF2, VTAM, system design and development concepts. Audit experience desirable.

**SYSTEMS** Systems Analysts - 2 years DB2, 3 plus years IMS-DC design and development. Structured analysis background a must. CASE tools a plus.

**Programmer** - 1 to 2 years "C" programming on PC, knowledge of COBOL, TSO/ISPF, MVS, JCL and SNA communication protocols.

**Programmer** - (1 maintenance, 1 development position) - 1 year application programming experience using COBOL and IMS-DB/DC.

**Data Base Analyst** - 5 plus years DBA experience with 2 plus years DB2 logical and physical design. Experience with DB2 Cobol programming, Data Administration and CASE tools helpful.

**Programmer/Analyst** - Knowledge of "Unisis" environmental software (DMS II, CP2000, GEMCOS). 2 to 6 years environmental work with 1 to 2 years project management.

**DATA PROCESSING** AS/400 Technical Specialist - 1 to 2 years administering AS/400 or System/38. Knowledge of APPN and APPC and PC systems a plus.

We offer an excellent salary and benefits package, including relocation assistance. If these positions sound interesting and you meet the qualifications, please send us a copy of your resume to the address below. If your resume isn't updated, call us collect at (404) 521-8326 and we'll talk. Please refer to the position you're interested in by title.

Federal Reserve Bank of Atlanta  
104 Marietta Street, N. W.  
Atlanta, Georgia 30303-2713

EOE M/F/H/V



## Recruit top computer career students at America's universities and colleges without leaving your office!

Don't miss *Computerworld's* third annual Campus Recruitment Edition, a special edition of *Computerworld* written just for and distributed only to university and college students planning computer careers!

Issue Date: October 31, 1990

Closing Date: September 28, 1990

For more information or to place your ad, call John Corrigan, Vice President/Classified Advertising, at 800/343-6474 x150 (in MA, 508/879-0700).

### CAMPUS RECRUITMENT EDITION

Southern California • Princeton University • University of Utah • State University of New York • University of Pennsylvania • University of Rochester • University of Minnesota • Georgia Institute of Technology • California Institute of Technology • Northwestern University • State University of New York at Buffalo • University of California at San Diego • Columbia University • Rutgers • The University of Virginia • Vanderbilt University • Southern Methodist University • United States Naval Academy • University Park • Rensselaer Polytechnic Institute • Washington University • York • Stevens Institute of Technology • Case Western Reserve University • State University of Michigan at Ann Arbor • Washington State • Stanford University • Massachusetts Institute of Technology • University of Los Angeles • Indiana University • University of California • Northwestern University • Carnegie Mellon University • University of Illinois • University of Pittsburgh • University of Tennessee • University of Virginia • Purdue University at West Lafayette • University of Washington • Michigan State University • Ohio State University • Texas A&W Western Reserve University • University of Southern California • University of Lehigh • University of Oregon • Emory University • George Washington University • University of Utah • Georgia Institute of Technology • University of Florida • Rochester • Pennsylvania State University • Washington University • University of New York at Buffalo • Syracuse University • University of Arizona • Boston College • Crummer • Vanderbilt University • Auburn University • University of Arkansas • California Poly University at Long Beach • California State University at Northridge • California State University at Fullerton • California State University at San Bernardino • California State University at Bakersfield • California State University at Fresno • California State University at Hayward • California State University at Long Beach • California State University at Northridge • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino • California State University at San Francisco • California State University at Stanislaus • California State University at Stockton • California State University at Sacramento • California State University at San Diego • California State University at San Jose • California State University at San Marcos • California State University at San Bernardino •

# Declare Your Independence

In today's world of mergers and buyouts, your future with a company can be uncertain. You owe it to yourself to take charge of your career and declare your independence.

TECH FAIR® offers an excellent opportunity for engineers and computer systems professionals to meet face-to-face with high technology companies who can show you what's available in today's high tech career marketplace.

At TECH FAIR, you can find out what you're worth, explore new career possibilities, get a closer look at projects and position openings, all in an informal, no pressure atmosphere.

So, come to TECH FAIR and declare your independence. There's a TECH FAIR coming to your area soon.

## AUGUST TECH FAIRS

**August 6-7**

Westcourt in the Buttes, Phoenix, AZ

**August 18-19**

(Black Expo '90)

Washington Convention Center,  
Washington, DC

# TECH FAIR®

THE NATION'S #1 JOB FAIR FOR ENGINEERING, SYSTEMS & SOFTWARE DEVELOPMENT PROFESSIONALS  
TECH FAIR is a Trade Mark of Business People Inc.  
Sponsored by BPI, 2985 Multifoods Tower, 33 South Sixth Street, Minneapolis, MN 55402  
For information call (612) 370-0550. We are not an employment agency.

*Policy Management Systems Corporation is a rapidly growing 300+ million dollar international corporation, with 4000+ employees and over sixty offices in the U.S. and fourteen foreign countries, that has provided software products, computer processing and insurance services for the insurance industry since 1974.*

## Programming Opportunities Columbia, South Carolina

Continued growth in the U.S. and International markets has created several opportunities at our Corporate Headquarters.

### • Programmer Analysts

This is an excellent growth opportunity in our state-of-the-art environment using COBOL, CICS, "C" and IBM's OS/2 Presentation Manager. Hardware consists of IBM 3090, AS 400, PS2, related peripherals and auxiliary equipment. Exposure in a life insurance environment would be a plus.

### • Data Base Analysts

Minimum 2+ years experience in physical data base design/performance tuning in DB2 environment.

We offer a competitive compensation and benefits package as well as the opportunity to learn and work within a rapidly growing, financially stable, service oriented company. Relocation packages are available.

For immediate consideration, call Philip Hughston at 1-800-833-PMSC or send your resume in confidence to:

**Policy Management  
Systems  
Corporation**

P.O. Box Ten  
Columbia, South Carolina 29202  
Attn: Philip Hughston  
Equal Opportunity Employer M/F



## A Terrific Opportunity

Computer Consulting Group, one of the Southeast's fastest growing contract programming and consulting firms, has immediate openings for talented Programmer/Analysts with 2 or more years experience. Excellent salary & benefits package. We're especially seeking:

**NATURAL/ADABAS  
CICS/COBOL  
IMS DB/DC  
IDMS/ADSO  
TECH. WRITERS  
LIFECOM  
DB-2  
SYS. PROGRAMMER  
VAX/FORTRAN/COBOL  
UNIX/C  
PL-1/COBOL  
VAX/C/INGRES  
AS400/COBOL  
I-CAD  
IDEAL/DATACOM**

## Computer Consulting Group

Contract Professional Services

**Research Triangle Area**  
4109 Wake Forest Rd  
Suite 307  
Raleigh, NC 27609  
**1-800-222-1273**  
(803) 738-1994  
**FAX (803) 738-9123**

## Hardcore Software People

We need analysts/programmers 2-3 years experience in a Hewlett-Packard environment. According to INC Magazine WTW is #130 of America's fastest growing companies, join our team and earn what you're worth. WTW is a national software consulting firm offering excellent salary and benefits and the opportunity to position yourself for success.

Call immediately or send resume:  
**1-800-833-2895**

Attn: Nancy Lawless  
Wesson, Taylor, Wells  
PO Box 3046  
Valley Forge PA  
19484-3046

Wesson, Taylor, Wells is an equal opportunity employer  
**WTW SOFTWARE CONSULTING SERVICES**

# TELON DB2

Get ahead with the company that's already there. Keane is clearly out in front. Our stock increased its value 218% last year. Forbes Magazine rated us one of America's best small companies. We've expanded into new territories, thanks to aggressive acquisition strategies. And our computer software consulting services are in demand from select Fortune 1000 manufacturers, major financial and insurance companies, service companies and government agencies. If you're a professional ready to get ahead, get in touch with Keane.

We have 20 offices from Maine to Florida and throughout the Midwest. In addition to TELON and DB2, Keane is continually looking for technical professionals with 2-5 years' experience in any of the following areas:

**IMS • COBOL • AS400 • PL/1 • ADABAS • SYSTEM 38 •  
FOCUS ASSEMBLER • IDMS • VAX • CICS • UNIX • C**

Keane offers all employees an opportunity to grow with the leading project-oriented computer software consulting company in the US; superb technical, management and project management training. Competitive salaries, comprehensive benefits including life and health insurance, 401K Plan, tuition reimbursement, and vacation condominiums. For more information, call Greg Alleyne at 1-800-899-5326; or send your resume to Keane, Inc., 36 So. Charles St., Suite 2350, Baltimore, MD 21201. An equal opportunity employer.

Other positions available in: CT, MA, MD, ME, MN, NH, NJ, NY, IL, PA, RI, OH, FL, GA.



## ONE COMPANY. ENDLESS POSSIBILITIES.

# ELIMINATE THE BOTTLENECKS IN YOUR CAREER



## SYSTEMS ENGINEER - IBM MID RANGE

EMC Corporation is the world's largest independent manufacturer of Systems Enhancements for a wide range of computer storage systems. As we expand our memory and array storage systems production we are looking for an outstanding engineer who thrives in an entrepreneurial environment, takes pride in producing high quality, technology products and works on a team to accomplish a common goal. Traded on the NYSE, EMC's growth in 1990 is running 44% ahead of last year.

As we expand our storage product offering in the AS400 system, we require an individual with in depth knowledge of the software and architecture. This position will play a key role in product definition as well as systems execution and ultimately philosophy. The candidate should have directly

related experience and the specific knowledge of these machines and have worked in a product development environment. BS, MS preferred EE, CS, CE. (Reference RV-1)

EMC Corporation provides excellent salaries and benefits including medical/dental, tuition reimbursement, profit sharing, 401K plan, ESPP, vacations, sick days and relocation assistance. Send your resume, with salary history and requirements, in confidence to Human Resources at the address listed below.

(No Agencies Please)

EMC Corporation  
171 South Street  
Hopkinton, MA 01748-9103

# EMC<sup>2</sup>

## FORTRAN Programmer

Min 5 years experience. Good knowledge COBOL, IBM Mainframe/MVS.

Major market research co. Midtown Manhattan.

Excellent compensation.

Resume w/cover letter & salary requirements to:

CW-37369  
Computerworld  
Box 9171  
Framingham, MA 01701-9171

## DP STAFFING SINCE 1969 FLORIDA CONNECTION

SR P/A C Windows DOS To 50K  
S/A IMS/DB2 To 46K  
S/A MVS Retail To 45K  
P/A MSA GL AR AP To 40K  
P/A MVS PL1 CICS To 39K  
P/A MVS Cobol DB2 To 38K  
P/A MVS Cobol CICS To 36K  
Sr P/A RPG3 MAPICS To 43K  
P/A MVS IMS DB/DC To 38K  
CONSULTANT IEW To 45K  
P/A HP ASK, Fortran To 36K  
P/A VAX ORACLE Cobol To 39K

Call Russell Bray, CPC or Cindy Swain  
**AVAILABILITY, INC.**  
Dept. C, P.O. Box 25434  
Tampa, Florida 33622  
813/286-8800  
FAX: 813/286-0574

## P/A'S FROM MID 20's TO LOW 40's

Major Omaha employers have multiple opportunities for talented DP professionals. Qualifications must include a minimum of one year applications experience using COBOL in an MVS environment. Any data base experience greatly enhances your marketability. Full relocation, excellent growth potential, solid benefits packages. Consider Omaha, rated the 37th best place to live in a survey of 329 metro areas in the U.S.

**ROBERT HALL INFORMATION SYSTEMS**

7171 Mercy Road #302  
Omaha, NE 68106  
(402) 397-8107 or  
(800) 279-0115



## When the business card says AGSI, it says a lot about you.

AGSI is a 12 year old consulting firm based in Atlanta. Participating in the design, development and implementation of data systems throughout the Southeast is our business.

AGSI has been selected as the recruiting agent for a Fortune 100 project. We are currently selecting both full-time and contract D.P. professionals for a 2 year assignment on this leading edge development project in Atlanta.

If your recent experience includes batch or online ASSEMBLER and CICS, then we have a place for you.

For immediate consideration, please forward your resume by mail, FAX, or call us today!

Principals and agencies are welcome to apply!

### ATLANTA GROUP SYSTEMS, INC.

2971 Flowers Road South  
Suite 275 • Atlanta, GA 30341  
(404) 455-7783 1-800-768-2474

FAX: (404) 451-5163

Attn: Pamela Hulecki

Equal Opportunity Employer

## Senior Programmer Analyst

Century Bank is a leading \$500 million commercial bank located in Boston with an outstanding record of growth and performance.

We are currently seeking a dedicated individual able to work independently with the Bank's user departments in designing, programming and implementing banking systems. We require at least five years of programming experience with strong RPG III skills on IBM Mid Range Systems. B.S. and banking experience preferred.

You'll discover that Century Bank is a progressive bank that offers excellent salaries, comprehensive benefits and bonus compensation. Qualified candidates may submit their resumes with salary history to: Yasmin Whipple, Human Resources, Century Bank, 376 Mystic Avenue, Medford, MA 02155.

An equal opportunity employer.



**Century Bank**

Because A Growing Community  
Needs A Growing Bank.

## South Carolina

Computer Consulting Group, a leader in the Consulting Industry, is currently seeking professionals to staff a large hi-tech project in South Carolina. Currently interviewing for:

### NAT/ADA

Programmer/Analyst to develop, code, and test Natural/Adabas programs. Requires a college degree, 3 years experience with IBM 3090, CICS, Natural/Adabas.

### DEC/VAX

Programmer/Analyst to design, develop, code, and test VAX/Fortran programs. Requires 3 years experience with VAX/Fortran, a college degree.

### TW

Computer  
Consulting  
Group

Contract Professional Services

Technical writers to produce quality documentation. Requires a college degree, one year experience, and the ability to read cobol code.

1-800-222-1273  
FAX (803) 738-9123  
4109 Wake Forest Rd  
Suite 307  
Raleigh, NC 27609

### AS/400-S/38 Analyst-Programmer

Develop Systems.  
Work with users.

RPG-III or RPG/400.  
Min 2 years experience.

Mapics-II or DB big plus.

Leading edge home  
hardware manufacturer.

Send resume &  
salary requirements.

MIS Mgr.  
**Dexter Lock Co.**  
PO Box 2322  
Auburn, AL 36830

### S/E POSITIONS

DBA - IDMS (3) .....\$40-52K  
P/A - IDMS ADS/O (25) ..\$30-45K  
P/A - CICS, COBOL (10) ..\$25-45K  
P/A - ASSEMBLER .....to \$45K  
P/A - DB2, COBOL .....\$30-45K  
P/A - MSA G/L, IDMS .....\$35K  
Proj. Mgr. - Food Service...\$55K  
Proj. Mgr. - IDMS, Mfg. ....\$70K  
S/P - CICS or VM/VTAM ..\$40-45K  
P/A - TANDEM .....\$40K  
DASD Mgr. - DFHSM .....40K

For more information on these and other positions in the S/E, Contact JIM BOSTIC, PHILLIPS RESOURCE GROUP, P.O. Box 5664, Greenville, SC 29606 or call 803/271-6350 (D), 803/292-1181 (E), or 803-271-8499 (FAX).

### MANAGEMENT CAREER PATH

- Seeking a Senior VTAM/NCP Netview Systems Programmer that has a strong in depth knowledge of these products and can perform in a back-up role on CICS or MVS. Successful candidate will have experience in creating and delivering presentations to upper management. Promotion to management is foreseen in 3-4 years. This major IBM mainframe shop has a 3,000 terminal network supporting the headquarters of a major consumer products company located in a very favorable cost of living area - a most exceptional relocation package and four seasons climate.

**SENIOR MVS/ESA SYSTEMS PROGRAMMER** - We need a strong MVS Internals Specialist with good performance tuning skills and possessing experience in heavy management interface - this is a 3090 shop located in the South Central U.S. Starting salary up to the high 60's.

**DB2 SYSTEMS PROGRAMMER** - Ideal candidate for this newly created position will have experience in support of MVS and related products using SMP/E in a smaller shop environment - location Deep South - very low cost of living.

To explore these or other systems programming opportunities, call Robert Taylor at 1 (800) 239-5457, or send resume to TECH-SEARCH, 904 Bob Wallace Avenue, Acuff Bldg., Suite 220, Huntsville, AL 35801; FAX # (205) 533-9898. Specializing in Systems Programmers since 1984 - Member firm of EDP Resource Group.

### AS400 Analyst/ Programmer TO 40,000

Dynamic AS400 environment seeks candidate with strong analytical skills. Experience with retail or financial systems will be considered a plus, but not required. If you desire to enhance your technical skills and career goals, call for further details. Heavy emphasis will be in new development.

**ROBERT HALF  
Information Systems**

7733 Forsyth  
St. Louis, MO 63105  
1-800-922-HALF  
FAX: (314) 727-1321



"And the Southeast"

The South is rising again with career opportunities in the growth center of the nation. The professional challenges and quality of lifestyle cannot be surpassed.

AS/400, S/38  
DB2/CICS  
MVS/ESA  
ORACLE  
UNISYS

DEC VAX  
C/UNIX  
PC/LAN  
IMS/IDMS  
TANDEM

**FOCUS  
EDP Recruiters**

3 Corporate Square, Suite 340-C  
Atlanta, Ga. 30329 (404) 321-5400  
Member EDP Resource Group  
Positions Nationwide

### Great CONSULTING Assignments/ and Exceptional FULL TIME Opportunities

Call & send your resume to

**MIMI  
SIMON ASSOC.**  
90 West Street, Suite 1105  
New York, NY 10006

(212) 406-1705  
Fax # (212) 406-1768

### HI TECH SALES

Aggressive Sales Account Executive or Manufacturer's Rep. needed for N.Y.C. Territory. Sell IBM SNA micro to mainframe communications software for fast growing, Southern California based Co. Five + years experience preferably in IBM SNA PC or mainframe software sales. Bachelor's Degree required. Excellent Benefits and Challenging career opportunities for self-directed, self-motivated individual. Send resume to:

**Network Software  
Associates, Inc.**  
Human Resources Department  
39 Argonaut  
Laguna Hills, CA 92656  
(714) 768-4013 E.O.E.

## ANOTHER REASON WHY COMPUTERWORLD RECRUITMENT ADVERTISING WORKS ...

Computerworld gives you large numbers of professionals who work in your industry.

When you're recruiting computer professionals, it's often important to find ones with experience working on systems specific to your industry. From manufacturing to banking, health-care to insurance, Computerworld reaches the right people in every major industry.

### Number of Computerworld Readers with Experience in Key Industries (Entire Career)

#### Job Industry of Computerworld's Audience ...

Computer Vendor and Consulting .....	147,897
Computer Manufacturer .....	79,521
large-scale computers .....	37,110
medium-scale computers .....	45,938
small-scale computers .....	33,851
personal computers .....	47,758
technical workstations .....	24,889
Software Vendor .....	130,589
for large-scale systems .....	57,561
for medium-scale systems .....	74,967
for small-scale systems .....	61,274
for personal computers .....	76,787
for technical workstations .....	26,379
Non-CPU Computer Products Manufacturer	36,994
VAR/dealer/retailer .....	27,557
DP Service Bureau/contract DP Services..	53,077
Consulting/planning .....	86,677
Manufacturer (not computers) .....	168,664
Insurance .....	52,910
Healthcare .....	64,729
Banking/financial Services .....	97,953
Government - federal/state/local .....	110,399
Business Service (except DP) .....	40,108
Communications Systems .....	28,913
Public Utilities .....	54,364
Transportation .....	26,031
Wholesale/retail Trade .....	111,095
Education .....	125,184

SOURCE: Skill Survey of Computerworld's Audience, May 1989.

To place your ad regionally or nationally, call John Corrigan, Classified Advertising Director, at 800/343-6474 (in MA, 508/879-0700).



**COMPUTERWORLD**

The weekly newspaper of record for computer professionals.

## System One

Vision, defined, is foresight and imagination. It is a quality of successful companies in today's dynamic travel environment. System One is such a company.

System One Corporation provides worldwide state-of-the-art information management, data processing, and telecommunications services to the travel community. Our recently announced partnership alliance with EDS (Electronic Data Systems) Corporation presents you with additional new opportunities for career growth and expansion.

Join a team with vision. System One...leading the way into the 21st century...worldwide.

### TPF Programmers

Requires minimum 1 year experience in TPF applications, systems, communications or coverage. Opportunities are available at both our South Florida and Los Angeles locations. Dept. DB01

### Data Base Administrators

Positions require 4-6 years experience as a Data Base Analyst in a large IBM installation running MVS/SP, XA or ESA. Extensive experience in Physical and Logical data base design in IMS and DB2. In depth knowledge of OS JCL, OS Utilities and DBRC also required. Strong leadership, interpersonal and communication skills essential. (South Florida location) Dept. SA01

### Data Administrators

Positions require 4-6 years experience as a Data Analyst in a large IBM installation running MVS/SP, XA or ESA. Extensive experience in Logical data base design and in-depth knowledge of Data Analysis, Data Modeling and Data Dictionary. Strong leadership, interpersonal and communication skills essential. (South Florida location) Dept. SA02

### Data Base Administrator

Requires an individual with exemplary communication skills to coordinate and maintain activities in an IMS environment (DB & DC with a particular need for DB2). Minimum 2 years DB2 experience. Will design, implement, and maintain databases/tables using various IMS support software to include IMS DB/DC (5 years experience), COBOL, CICS, MVS and PL1. Background in application analysis and programming preferred. (Houston location) Dept. JD01

### IMS DB/DC Programmers

Requires 3 plus years of business applications programming in an IBM mainframe environment using IMS DB/DC, and COBOL or PL1. A Bachelor's degree or equivalent experience is preferred. Airline industry experience is a plus. (Houston location) Dept. JD02

### MSA Programmers

Requires knowledgeable individual to develop financial systems programming using COBOL, MVS/OS JCL, IBM/MSA and 4-5 years of experience. Excellent communication and user interface experience essential. The incumbent will design, code, and test our programs for accounting applications. (Houston location) Dept. JD03

System One offers an excellent compensation package including relocation assistance and worldwide travel benefits. If you are interested in joining our progressive organization, please submit your resume to: System One Corporation, Human Resources, (insert appropriate department code), 9250 N.W. 36th St., Miami, FL 33178. Equal Opportunity Employer.

## World-Class Opportunities in Denver and Throughout the US

At AGS, a NYNEX Company, we look for and hire talented computer professionals to move our technology into the future.

AGS' Denver office has career opportunities for data processing professionals who are interested in sophisticated technologies, teamwork and proving their talents. Having recently won a large, long-term project to develop information solutions for a major organization, our Denver office is seeking individuals with a B.S. in C.S. and experience in the following areas:

- COBOL/COBOL II
- Relational database, DB2 preferred
- Accounting & CICS exposure desirable

AGS offers competitive salaries and a comprehensive benefits package including medical and dental coverage, training, tuition reimbursement, a 401K savings plan and more. Please send resume to:

Loree Tisdale  
Sr. Technical Resources Mgr.,  
National Recruiting  
AGS Information Services, Inc.  
1139 Spruce Drive  
Mountainside, NJ 07092

**AGS**

A NYNEX Company

(800) HIRE-AGS  
Fax (201) 654-9794

An Equal Opportunity Employer M/F/H/V

Arizona California Colorado Connecticut  
Delaware Florida Georgia Illinois Indiana Maryland  
Massachusetts Michigan New Jersey New York  
North Carolina Ohio Pennsylvania Texas

# More Challenge Per Square Inch

At Amdahl, our professionals have world class ability. Their outstanding performance supports and advances our large-scale, high performance computer systems. If you expect the best from your company, co-workers and yourself, achieve it - with Amdahl.

## MANUFACTURING SYSTEMS SUPPORT

We are committed to World Class Manufacturing as we begin development of our newest product. In support of that concept, our manufacturing organization is in the process of implementing and integrating major CIM projects to provide process, test and quality support throughout production and interfacing with engineering and the field. You can play a key role in the success of these projects if your qualifications meet the requirements in the following positions which are located in the San Francisco Bay Area.

**UNIX Systems/Network Administration** Assume a major role in the integration of major CIM systems by designing and managing a state-of-the-art global network system in a UNIX\*-based workstation environment. In this capacity, you will be involved in the use of distributed databases, file servers, workstations and mainframe computers. A strong background in UNIX systems and network administration in a workstation environment is required. Project management experience is considered a plus. A BS/MS in Computer Science or equivalent experience is required.

**Senior Oracle Programmer Analyst - Project Leader** Take total responsibility for the definition, enhancement and integration of new and existing Reliability Management Systems within our state-of-the-art UNIX-based workstation environment. You will interface with engineering and manufacturing to define system requirements and provide technical leadership to programmers within the department. You must have a strong background in relational database design (Oracle Forms, SQL\*Plus, and SQL\*Report) to include project management and systems analysis experience. Knowledge of FRAMEMAKER is desirable. BSCS, EE or equivalent experience is required.

The satisfaction of exceptional challenge awaits you. Send your resume to Amdahl Corporation, Employment Department 7-21, P.O. Box 3470, Mail Stop 300, Sunnyvale, CA 94088-3470. Principals only, please. Amdahl Corporation is proud to be an equal opportunity employer through affirmative action.

\*UNIX is a registered trademark of AT&T.

**amdahl**



### Northern California

Near mountains, ocean,  
Tahoe, Yosemite.

Contractors & Full Time  
DB2, CICS, VSAM, IDMS  
IMS, CSP, ESA

- Data Base Managers
- Director Data Center
- Data Security Analysts (RACF)
- Project Managers
- Programmer Analysts
- Systems Programmers
- Systems Analysts
- Data Base Analysts

Free 1990 salary survey available. Send resume.

Chuck Klein & Assoc.  
3840 Thorson Dr.  
Pleasantville, CA 95667  
(916) 644-6396

**TANDEM**  
COBOL, PATHWAY, TAL,  
SCOBOL, C, SQL, X.25

**STRATUS**  
PL1, COBOL, C  
Fulltime/Consulting Positions available in the US/ABROAD  
VAX MUMPS ORACLE IBM

**STRATEM**  
COMPUTERS INC.  
Call Irwin (212) 967-2910  
FAX (212) 967-4205  
124 W. 30th St., Suite #302  
New York, NY 10001

Data Processing/Computer Systems

**TELX** CORPORATION

## SYSTEMS OPPORTUNITIES

Telxon's position as the leader in the hand-held computer industry reflects our state-of-the-art technology and responsiveness to our customers' needs. Due to continued growth and our company focus as a systems integrator, we have immediate openings for systems professionals in Akron, Ohio; Chicago; Washington, D.C.; Atlanta; St. Louis; San Francisco and Los Angeles. We are currently recruiting for the following positions:

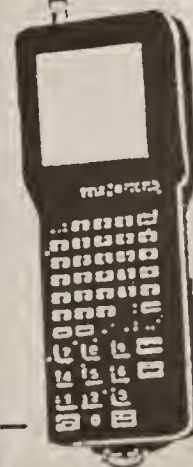
### SYSTEMS ENGINEERS

- B.S. degree in Computer Science or related field.
- 3 to 5 years experience in distributed systems integration with host computers using data communications.
- Proficiency in structured systems analysis with strong verbal and written communication skills.
  - Knowledge of current communication protocols to include SNA/SDLC, TCP/IP, X.25 and LANS.
  - "C", COBOL and/or Assembler programming skills.
  - Travel required.

### BUSINESS ANALYSTS

- B.S. degree required; Master's a plus.
- Proficiency in structured systems analysis with strong communication skills.
- Minimum 5 years experience in distribution to include the understanding of the use of computers in efficient warehouse and route distribution operations.
- Strong interpersonal skills.
- Travel required.
- Exposure to RF communications a plus.

Telxon looks for professionals who enjoy individual responsibility and challenge. We offer a competitive compensation and benefits package including growth potential. For confidential consideration, please forward a resume to: Telxon Corporation, Dept. SOC, 3330 West Market Street, Akron, OH 44313.



Equal Opportunity Employer



**ATLANTA:** DataPro Personnel Consultants  
1050 Crown Pointe Pkwy, Suite 430  
Atlanta, GA 30338 (404) 392-9990  
**BOSTON:** Robert Kieven & Co., Inc.  
P.O. Box 636  
Lexington, MA 02173 (617) 861-1020  
**CHICAGO:** Thomas Hirtz & Associates  
150 North Wacker Drive, Suite 1700  
Chicago, IL 60606 (312) 977-1555  
**CINCINNATI:** Task Group  
7875 Reading Road  
Cincinnati, OH 45237 (513) 821-8275  
**CLEVELAND:** Innovative Resources Corporation  
Beachcliff Executive Centre  
1340 Depot Street, Suite 210  
Rocky River, OH 44116 (216) 331-1757  
**COLUMBUS:** Michael Thomas, Inc.  
450 W. Wilson Bridge Road, Suite 340  
Worthington, OH 43085 (614) 846-0926  
**DALLAS:** DataPro Personnel Consultants, Inc.  
13355 Noel Road, Suite 2001  
Dallas, TX 75240 (214) 661-8600  
**DENVER:** Abacus Consultants, Inc.  
1777 South Harrison Street, Suite 404  
Denver, CO 80210 (303) 759-5064  
**DETROIT:** Electronic Systems Personnel  
3000 Town Center, Suite 2580  
Southfield, MI 48075 (313) 353-5580  
**GREENSBORO:** DataMasters  
P.O. Box 14548  
Greensboro, NC 27415-4548  
(919) 373-1481  
**HARTFORD:** Compass, Inc.  
875 Asylum Avenue  
Hartford, CT 06105 (203) 549-4240  
**HOUSTON:** Career Consultants, Inc.  
1980 Post Oak Boulevard, Suite 1050  
Houston, TX 77056 (713) 626-4100  
**KANSAS CITY:** DP Career Associates  
6405 Metcalf, Suite 502  
Shawnee Mission, KS 66202 (913) 236-8288  
**LOS ANGELES:** Superior Resources, Inc.  
22653 Pacific Coast Highway, Suite 1-106  
Malibu, CA 90265 (818) 884-3000  
**MEMPHIS:** Information Systems Group  
4646 Poplar, Suite 417  
Memphis, TN 38117 (901) 684-1030  
**MIAMI:** Data Sciences Personnel, Inc.  
P.O. Box 8577  
Hollywood, FL 33084 (305) 434-6112  
**MILWAUKEE:** EDP Consultants, Inc.  
Chancellor Park II, Suite 350  
350 N. Sunnyslope Road  
Brookfield, WI 53005 (414) 797-8855  
**MINNAPOLIS:** Electronic Systems Personnel  
880 International Centre  
900 2nd Avenue South  
Minneapolis, MN 55402 (612) 338-6714  
**NEW JERSEY:** Systems Search  
2040 Millburn Avenue  
Maplewood, NJ 07040 (201) 761-4400  
**NEW YORK:** Botal Associates, Inc.  
7 Day Street, Suite 410  
New York, NY 10007 (212) 227-7370  
**PHILADELPHIA:** Systems Personnel, Inc.  
115 West State Street  
Media, PA 19063 (215) 565-8880  
**PHOENIX:** Professional Career Consultants  
4725 North Scottsdale Road, Suite 209  
Scottsdale, AZ 85251 (602) 274-6666  
**PITTSBURGH:** KGS Computer Services, Inc.  
400 Penn Center Blvd, Suite 320  
Monroeville, PA 15135 (412) 823-8632  
**ROCHESTER:** Traynor Confidential Ltd.  
10 Gibbs Street, Suite 400  
Rochester, NY 14604 (716) 325-6610  
**SAN DIEGO:** Technical Directions Inc.  
8880 Rio San Diego Dr., Suite 1025  
San Diego, CA 92108 (619) 297-5511  
**SAN FRANCISCO:** Professionals for Computing, Inc.  
455 Market Street, Suite 1850  
San Francisco, CA 94111 (415) 957-1400  
**SEATTLE:** Houser, Martin, Morris & Associates  
110 110th Avenue N.E., C-90015  
Bellevue, WA 98009 (206) 453-2700  
**STAMFORD:** Hipp Waters Professional Recruiting  
707 Summer Street  
Stamford, CT 06901 (203) 357-8400  
**ST. LOUIS:** Executive Career Consultants  
795 Office Parkway, Suite 100-CW  
St. Louis, MO 63141 (314) 994-3737  
**SYRACUSE:** The CFA Group Inc.  
5790 Widewaters Parkway  
Dewitt, NY 13214 (315) 446-8492  
**WASHINGTON D.C.:** Technical Recruiters  
8701 Georgia Avenue, Suite 607  
Silver Spring, MD 20910 (301) 495-3111  
**AUSTRALIA:** For information, contact the  
NCA firm nearest to you

## Computer Professionals Expect NCA To Provide Outstanding Relocation Services...and we have... thousands of times!

National Computer Associates has the largest network of independently-owned EDP placement firms in America. Every day, those firms, working in close cooperation with one another, are actively involved in the relocation process. Because our firms are located in most of America's major cities, we can find you the position you want anywhere you may want to live.

We have relocated thousands of computer professionals over the years. They have been delighted to learn that most employers pay interview and relocation costs and, furthermore, that employment was secured before they moved.

Come in. Call. Or mail your resume to the NCA firm nearest to you. No charge to you for any of our excellent services. Relocation is just a phone call away!



**National  
Computer  
Associates**

## EXPERIENCED IN ADABAS/NATURAL II ?

Then you have a great future to look forward to with **Turn-Key Solutions**, a dynamic computer consulting and management company with a long and distinguished list of clients.

The continually growing demand for our expert services, has created long- and short-term Assignments and Opportunities throughout the country. Flexible hours are available. Degree preferred, but we will consider comparable experience.

We offer an excellent, highly competitive compensation and benefits package. For prompt consideration, please forward your resume to or call:

**MIKE SULLIVAN**  
1-800-275-6612

**TURN-KEY SOLUTIONS, INC.**  
15 Malden Lane, Suite 805  
New York, N.Y. 10038

**FAX: 212-619-5047**

**Contract or Full Time Available.**

An Equal Opportunity Employer M/F  
(Sponsorship Available)

*Turn-Key Solutions, Inc.*

## COMPUTERPEOPLE, INC.

### -National Division-

Permanent & Consulting  
opportunities abound  
nationwide in these  
technical areas:

**Database \$25-\$55K**  
IDMS/ADSO  
IMS - DBRC a plus  
DB2  
4th Dimension (Macintosh)  
Image (HP 3000)

**AS400/  
SYSTEM 38 \$22-\$38K**  
RPG III

**C/UNIX on DEC or IBM**  
Informix to \$45K  
Oracle to \$45K  
Networking to \$40K

**IBM/MVS/  
CICS, P/A's \$25-\$35K**

**Free Consultation  
Call 1-800-955-9695  
Colleen or Noreen**

**Fax Resume  
1-716-883-0776**

\* Resume not required

**SYSTEMS ANALYST** wanted by SW Ohio management services firm to analyze proposed and existing microcomputer applications; study existing data handling systems to evaluate their effectiveness; conduct special studies & investigations pertaining to development of new information systems to meet current and projected needs; plan & prepare or assist in preparing technical reports, studies, and evaluations relative to data communications using the local area networks. Must have an MS in Computer Science, education must include at least one course with each of micro-to-mainframe data transfer, local area networks & mainframe software. 40 hrs/wk. 8am-4:30pm. Mon-Fri. \$29,400/yr salary. Must have proof of legal authority to work permanently in the U.S. Send resume in duplicate (NO CALLS) to J. Davies, JO# 1099707, Ohio Bureau of Employment Services, P.O. Box 1618, Columbus, Ohio 43216.

## SYSTEMS

### DB2/DBA . . . . .

. . . . .IMMED. Need, in Manhattan

## Learn DB2

Call Bob or send resume to  
(212) 944-9250  
**Exec Computer**  
1440 Bway Suite - 1652  
NYC 10018  
or FAX (212) 869-2846

## \*\*\* TELON / ADF \* IMS / DC \*\*\* \* ADABAS / NATURAL \*

Our client, a major S/W house in Saudi Arabia has 12 urgent positions opened for Systems Analysts with experience on the above softwares. Specific experience must be in materials or human resources or financial systems.

Contracts are for one year renewable - salaries are up to 60K per year, tax free, depending on your experience, with free housing, expat/repatriation tickets, medical insurance, vacation tickets, local transport allowance, etc.

\* Preferably Fax Or Send Your C.V. To \*

### INFORMATIQUE COM-TEL

79 rue St-Pierre, QUEBEC, G1K 4A3, Canada  
FAX: (418) 694-9679

We have a great number of positions opened in other areas such as: 3-COM Network Specialists, Storage/Engineer, DB2 Specialists, MVS/XA Systems Programmer, ADABAS/NATURAL DBAs & Analysts, etc. If you are interested to earn tax free salaries, send your C.V. as well.

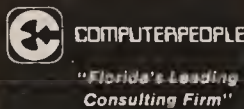
## GIVE YOUR FAMILY THE FLORIDA LIFESTYLE THEY DESERVE!

Looking for a career move with growth potential? Enter one of the country's fastest growing job markets without sacrificing previous career accomplishments. Plus live, work, and play in the healthiest climate anywhere! If you have 2+ years of experience and your skills are in one of the following technical areas:

DB2/SQL PATHWAY/SCOBOL  
CICS/COBOL IMS/OL1  
TANDEM/TAL M&O  
ORACLE AS400  
FOCUS IOMS  
MVS/ALC UNIX/C  
OCS MSA  
CASE TOOLS HP3000  
VAX/COBOL AA/DCS

We can get you in front of the decision makers! Call or send resume to:

COMPUTERPEOPLE, Dept. 503  
12225 28th Street North  
St. Petersburg, FL 33716  
**813-573-2626**  
**800-888-1064**  
20 N. Orange Avenue, Ste 1400  
Orlando, FL 32801  
**800-888-1064**  
2005 N.W. 52nd Street, Ste. 3  
Ft. Lauderdale, FL 33309  
**305-771-8603**  
**800-777-8603**



### IBM System/370 Technical Consultants and Instructors

Small, Maryland-based national technical services firm requires consultants and classroom instructors for occasional and part-time work. Some work can be performed after hours, in your home. Moonlighters, at-home mothers and retirees welcome.

We require experienced systems programmers, instructors and hardware engineers who can assist us in serving our clients. IBM S/370 SCPs, IBM and 3rd party subsystem software and communications software, all IBM and compatible large-system hardware, benchmarking and performance evaluation, hardware installation and maintenance and installation planning. We provide excellent remuneration and we work around your commitments, work schedule and geographic preference. We'll call you with opportunities as they arise or we'll contract your services to our regular clients for part-time or occasional work. You can check with our bulletin board and "bid" for interesting assignments when you're free for outside work. Our clients are located throughout the US. Send your resume in complete confidence to: Michael Ward, MJWARD Research and Services, Inc., 14832 Keeneland Circle, Gaithersburg, MD, 20878, or FAX to (301) 377-7531.

## AMPEX

Ampex, recognized internationally, as the world leader in magnetic tape technology, has the following career opportunity available:

### ANALYST/ PROGRAMMER

BS degree in Computer Science or related field desired with 2+ years related experience in Programming or Systems Analysis positions in a manufacturing applications environment. HP, COBOL, and structured analysis and design background desired.

Ampex offers excellent career opportunities, competitive salaries and fringe benefits. Southeastern location within 10 miles of Auburn University. Send resume to:

**John B. Cotton,**  
Manager, Professionals  
Recruiting  
**AMPEX  
RECORDING  
MEDIA  
CORPORATION**  
P.O. Box 190  
Opelika, AL 36803-0190  
EEO/No Agencies Please

### CALIFORNIA CONTRACTS/PERMANENT

**VSE Internals**  
ESA, MVS, VM Sysprogs  
SNA/VTAM Apps  
**MVS Subsystem Developers**  
CICS Internals & Performance  
OS/2 PM & EE Developers  
**MS Windows SDK**  
**VM Performance & Internals**  
DB2 Internals  
Relocation expenses paid by Employer. Salaries to \$100K  
**XA International**  
10413 Torre Avenue  
Cupertino, CA 95014  
Jim Turley (800) 533-7751  
FAX (408) 446-4750

Immediate Permanent/Consulting  
**TANDEM**  
East Coast/Mid-West/West Coast

**Junior & Senior P/A's**  
System & Project Managers  
Banking, Brokerage, Telephony  
Manufacturing, Comm & others  
PATHWAY, SCOBOL, COBOL,  
C, TAL, Non-Stop SQL, SNAIX,  
BASE-24, OLTP, QA

Mail or Fax resume to Steve at:

**TALON  
Professionals, Inc.**  
11827 Breton Ct., Ste. C12  
Reston, VA 22091-3224  
(703) 264-5052

Serving Only TANDEM Users &  
Professionals Across the U.S.

**Technical Director, Effects, Animation, Design Group.** Responsible for supervision and direction of all technical aspects of the Effects, Animation and Design Group. Responsibilities include developing and implementing technological changes to ensure state-of-the-art production techniques, developing custom digital video techniques, such as the "Hyper F/X" compatible with the Company's custom-designed Macintosh machine and control software. Evaluate and recommend purchase of new equipment. Attend pre-production meetings to advise on post-production techniques to be used based on interpretation of video storyboards or animation. Attend post-production session when required to consult/advise on correct implementation of techniques and equipment. Attend on-location film shoots and advise/consult to ensure material is correct for post-production. Work directly with production, operations and engineering departments of company with all matters pertinent to a smooth operation. Develop and maintain good relationships with relevant manufacturers and suppliers. Attend group technical meetings, conferences when deemed necessary and work with sister companies on all matters pertaining to the job. **REQUIREMENTS:** BS degree in Electrical Engineering or Computer Science. Must have 3 years experience as Technical Director of Effects, Animation and Design Group or 3 years experience in related occupation as Production Support Manager-Video or Video Graphics Systems Engineer. Experience in related occupation shall include 3 years experience in the areas of 2D and 3D animation including high definition television, and digital video component image processing and compositing, and 1 year of experience in television production as a Studio Engineer. Experience in television production as Studio Engineer may be had concurrently or consecutively, 40 hour work week. Hours: 9:00 a.m. to 5:00 p.m. Salary: \$70,000 per year. Interested applicants send resume to Illinois Department of Employment Security, 401 South State Street-3 South, Chicago, IL 60605. Attention: Mary Millea. Reference #V-IL-1148-M. An Employer paid ad.

## MAINE - NH \$25,000 - 50,000 Salary

ROMAC, the largest and oldest placement agency in this area, is seeking qualified data processing professionals with salary requirements in the \$25,000-\$50,000 range. Our clients pay our fees.



Att: Dept. 2  
P.O. Box 7040  
Portland, ME 04112  
(207) 773-4749  
FAX (207) 773-2645

## PROGRAMMERS IMMEDIATE OPENINGS

DB2 CICS P/A Pure Development	65K
FOCUS Heavy Tech	60K
COBOL CICS Financial - Full Life Cycle	50K, 65K
IMS DB Train CICS	45K
PL1 International Sec.	40K

Please contact Dave

**Exec Computer**  
1440 Broadway - Suite 1652  
New York, NY 10018

**Tel: (212) 944-9250**

**FAX: (212) 869-2846**

### NATIONWIDE SEARCH

Currently our clients demand for both contract and permanent positions is growing extremely high. MIS professionals in all levels and specialties are encouraged to call or send resume **NOW:**

- IMS/DB/DC
- HP3000
- Oracle/SQL
- MVS/XA/VTAM
- CICS/JCL/Cobol
- DOS/COBOL
- AS400
- System 36 or 38 RPGIII
- ASK/Omar/Manman

**Executive Systems Group**  
3333 Bowers Ave., Ste. 200,  
Santa Clara, CA 95054, (408)  
970-8595, FAX: (408) 970-8603.

**Systems Analyst - Cincinnati, OH.** Responsible for design, development, implementation & maintenance of data base using APS, COBOL languages, CICS, DATACOM & DB2 software on IBM mainframes. Provide technical support. 2 yrs/exp. in job offered or 2 yrs as Analyst/Programmer using APS, COBOL, ICCS, DATACOM, DB2 software. 35hrs/wk (9-5). \$47,000/yr. Must have proof of legal authority to work permanently in U.S. Send resume in dupl. (no calls) to J. Davies, JO# 1099635, Ohio Bureau of Employment Service, PO Box 1618, Columbus, OH 43216.

### Systems Analyst/DBA

Leading commercial nursery with multi-site operations is looking for a Systems Analyst/DBA to assist in application development, operations and resource management in a Unisys A-series environment. A minimum of 2 years experience in systems analysis, programming and knowledge of Unisys DMSII required. PC experience a plus. Please send your resume with salary history to: Human Resources Director, Springtime Inc. 1, 3150 SE Minterbridge Road, Hillsboro, OR 97123, or FAX (503) 648-9836.

**Systems Analyst - analyze users' needs; design, develop, test & implement commercial applications; write specifications; use IBM mainframes, CICS, TSO/ISPF, MVS/XA; enhance warehousing systems using Assembly language. Bachelors Degree in Computer Science. 2 yr/exp. using IBM mainframes, CICS, TSO/ISPF, MVS/XA, incl. 6 mos/exp. enhancing warehousing systems using Assembly language. 40hr/wk; \$33,000/yr. Apply by resume to: John Isehower, Job Order #C962431, Job Services, 176 Lockwood Drive, P.O. Drawer N, Charleston, S.C. 29492**

**Now you have a new way to recruit  
university and college students  
planning computer careers:**

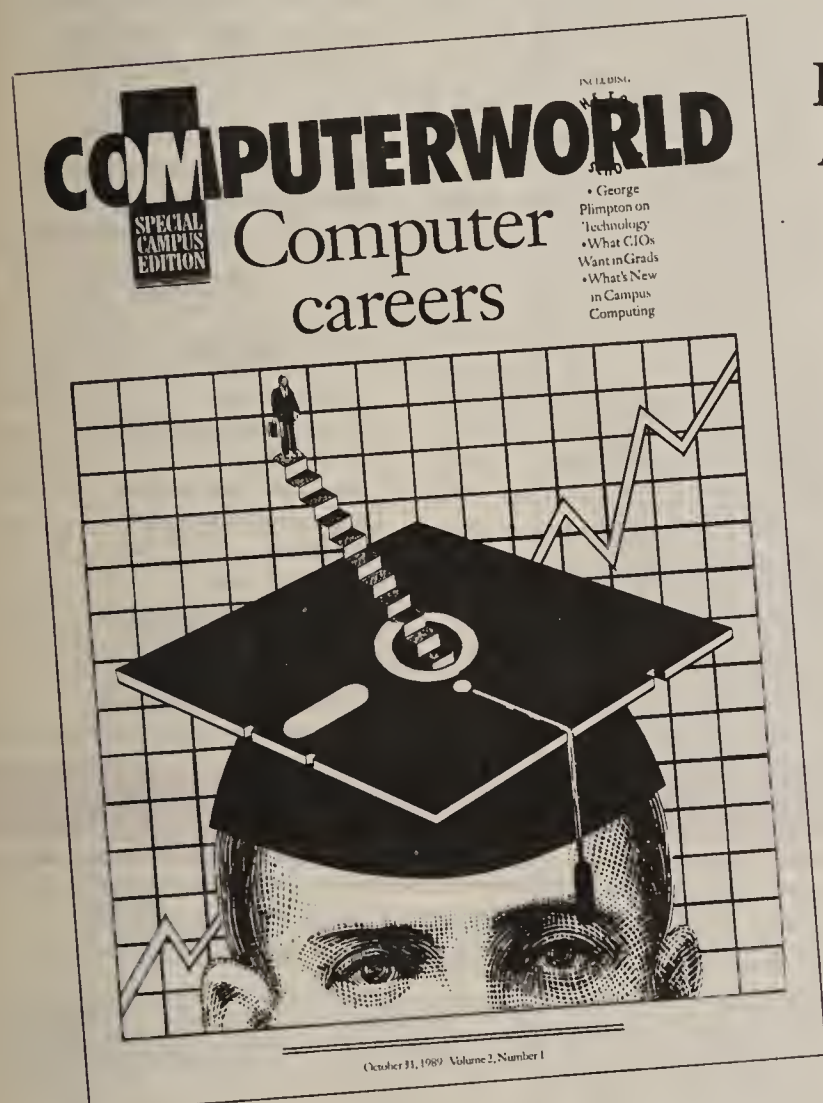


## **Computerworld's third annual Campus Recruitment Edition**



**Issue Date: October 31, 1990**

**Close: September 28, 1990**



If you recruit top computer career students on America's campuses, your message in this special issue will target more of them than any other newspaper or magazine!

**Now you can recruit computer talent on campus without leaving your office!**

That's because 115,000 copies of this special issue will be distributed to America's best and brightest students enrolled in Management Information Systems (MIS), Computer Science, Computer Engineering, Electrical Engineering, and just about any other computer-involved curricula.

**Finally you can cost-effectively reach the quality and quantity of students you need!**

And you can do it with just one ad in *Computerworld's Campus Recruitment Edition*! For a rate card reflecting complete campus distribution, call John Corrigan, Vice President/Classified Advertising, at (800) 343-6474 (in MA, 508/879-0700). But hurry ... this issue closes September 28!

### **Planned Editorial Features:**

(subject to revision)



- MIS salary and job satisfaction survey
- Where are the best jobs?/What positions are hot?
- Experiences of recent MIS graduates in their first jobs and what helped them in school
- The MIS career ladder
- Profiles of acclaimed top level MIS executives
- The strategic advantage of computers and how they play a key role in running a company

## Get ready for GNU software

Free Software Foundation has created a suite of giveaway programs

BY SIMSON L. GARFINKEL  
SPECIAL TO CW

To Richard M. Stallman, one of the world's most prolific programmers, proprietary software has put millions of people in a dilemma. As computer users, we are routinely faced with the choice of becoming criminals by making copies of programs for friends or being bad neighbors by refusing to make copies.

Six years ago, Stallman set out to change that situation. "My fundamental motivation," he says, "was to be part of a software sharing community in which people can give copies of programs to their friends without having to hide it and without having to be sneaky. I decided that I was going to do it even if I had to write all the software myself."

What might have been an unthinkable task for others has been a mere matter of coding for Stallman, who by many accounts may be the world's best programmer. He set out to create an entire suite of computer programs — word processing packages, spreadsheets, compilers, debuggers and the like — and an operating system on which it

would run. He modeled his project on the Unix operating system and called it GNU, a tail-chasing acronym for Gnu's Not Unix.

Stallman's first program, a powerful text editor called GNU Emacs, is becoming the standard Unix programmer's editor. GNU Emacs runs on more than 50 different computer systems, and anyone with a copy of it can give one to anyone else.

Stallman, now president of the Free Software Foundation in Cambridge, Mass., coordinates seven paid programmers and more than 200 volunteers across the country. Other paid employees write documentation and fill orders for manuals and tapes. The foundation earned \$330,000 in 1989 and received \$267,000 in gifts from companies and individuals. Last month, Stallman was awarded a \$240,000 "Genius Grant" from the MacArthur Foundation.

Stallman's second program, the GNU C Compiler (GCC), has been ported to more than 13 microprocessors. In many cases, it generates code that is faster and more compact than the out-

put of compilers that cost thousands of dollars. GCC comes with workstations sold by Data General Corp. and Next, Inc., while Lotus Development Corp. uses it to compile its Unix-based applications.

Firms use free software because it is better than the commercially available programs it replaces. Because users have the source code, they can isolate and repair bugs themselves. Fixes are incorporated into the

master sources at the foundation and are made available over computer networks. The programs are brimming with features and options added by thousands of programmers from all around the world.

Nevertheless, many firms are hesitant to use free software because of one concern: support. The Free Software Foundation has no telephone support lines, no customer applications engineers and no accountability to its customers. The programs come as source code; customers must compile and install the programs for themselves.

Stallman and others do answer questions and fix bugs, gen-



erally faster than their commercial competition, and the foundation distributes a list of more than 50 consultants who have made GNU software a speciality. For years, Stallman has maintained that as soon as his software becomes popular, firms will be started up to support it.

One such company has already appeared — Cygnus Support in Palo Alto, Calif. The company is headed by Michael Tiemann, author of G++, which is the GNU compiler for the object-oriented C++ programming language. Tiemann says that his company will "satisfy the need that free software is generating."

Like GNU software in general, customers can use a Cygnus program on machines from a multitude of manufacturers. They can also redistribute it without paying royalties or signing licensing agreements. In its first quarter, Cygnus wrote \$200,000 worth of support contracts.

Meanwhile, back in Cambridge, Stallman and his band of programmers press on. Programs currently under development include an X Window System-based spreadsheet and a symbolic math system. The group expects to turn out an entire Mach-based operating system for IBM machines based on Intel Corp.'s 80386 and for Sun Microsystems, Inc. workstations before the end of next year.

One thing that might put a

damper on the GNU project is the increasing prevalence of software patents. Since the mid-1980s, the federal government has been granting patents on computer algorithms. Last year, Refac Technology Development Corp. in New York filed suit against Lotus and several other spreadsheet vendors, claiming that their best-selling programs infringe on a patent Refac purchased.

"We are asking what is considered a reasonable royalty: 5% on the net selling price," Refac Chairman Eugene Lang says.

While such patents present problems for all software developers, they could pose an insurmountable barrier to developers such as Stallman who want their programs freely distributed and thus could not pay royalties.

Garfinkel is a free-lance writer and computer consultant based in Cambridge, Mass.

### Index

Marketplace ..... 102

Buy/Sell/Lease ..... 102

Bids/Proposals/Real Estate .. 104

PC Products ..... 104

Business Opportunities ..... 105

Graphics/Desktop Pub ..... 105

Software ..... 105

Time/Services ..... 105

Conversions ..... 106

Peripherals/Supplies ..... 106

Training ..... 107

### Buy/Sell/Lease

#### COMPUTER ROOM EQUIPMENT

##### LIEBERT

Computer Room Air Conditioners  
3 thru 22 Ton Units  
Main Frame Chillers  
3 thru 12 Ton Units  
Power Distribution Units  
30 thru 225 KVA

##### PILLER

40 & 75 KVA Silentblocks

LIEBERT, EXIDE, EMERSON  
EPE & IPM

18.75 - 556 KVA UPS Systems

#### RAISED ACCESS FLOORING

Thousands of square feet in stock,  
wood and steel.

All items listed are reconditioned with warranty



**DP SUPPORT**  
P.O. Box 1409  
Plano, TX 75086  
214-422-4551  
214/578-1236 Fax

#### NEW WANG PC's at Significant Savings

- Custom configurations for LAN networking
- Professional Service, Fast Delivery
- Also IBM, Epson, NBI, HP, NEC and Arche PCs.

#### ALSO WANG REMANUFACTURED PRINTERS • VS • PERIPHERALS

SAVE UP TO 50%

- Remanufactured equipment qualifies for free WANG installation and is guaranteed for the WANG Service Contract
- Large Inventory, Fast Delivery



An Office Automation Company

1-800-223-9264

AUTHORIZED WANG PC •

AND REMANUFACTURED DEALER

\*EASTERN ZONE AND SOUTHERN CALIFORNIA ONLY

SALE, LEASE OR RENTAL

**IBM 3827**

LASER

PAGE PRINTER

QUANTITY AVAILABLE  
LIKE NEW-LOW CLICKS

WAY BELOW IBM PRICING

KEN BOUSFIELD  
(408) 241-3677

**marketex**  
Computer Sales/Leasing

#### HONEYWELL

##### NEW/USED EQUIPMENT

- All Models
- Ultimate Equipment
- Older Equipment Available
- Buy-Sell-Lease-Trade

##### PARTS & REPAIR

FULLY GUARANTEED

PROMPT DELIVERY

Call: Level 6 Systems

1-216-951-2221

**BULL**

#### The BoCoEx index on used computers

Closing prices report for the week ending July 27, 1990

	Closing price	Recent high	Recent low
IBM PC Model 176	\$400	\$660	\$250
XT Model 086	\$500	\$700	\$350
XT Model 089	\$675	\$825	\$475
AT Model 099	\$1,050	\$1,375	\$850
AT Model 239	\$1,075	\$1,325	\$700
AT Model 339	\$1,375	\$1,400	\$900
PS/2 Model 50Z	\$1,650	\$2,000	\$2525
PS/2 Model 60	\$2,500	\$2,600	\$2,400
Compaq Portable II	\$975	\$1,150	\$875
Portable III	\$2,175	\$2,500	\$1,900
Portable 286	\$1,400	\$1,675	\$1,300
Plus	\$675	\$750	\$650
Deskpro	\$825	\$900	\$800
Deskpro 286	\$1,400	\$1,625	\$1,300
Deskpro 386/16	\$2,500	\$2,750	\$2,475
Apple Macintosh 512	\$375	\$775	\$275
512E	\$450	\$450	\$350
Plus	\$1175	\$1,275	\$1000
II	\$3,200	\$3,500	\$3,050

INFORMATION PROVIDED BY THE BOSTON COMPUTER EXCHANGE CORP.

Go Shopping in...

Computerworld's

**CLASSIFIED MARKETPLACE**

Call for all the details

**(800) 343-6474**

(In MA., (508) 879-0700)

Buy/Sell/Lease

CLASSIFIED  
MARKETPLACE

Examines the issues  
while computer  
professionals examine  
your message. Call for  
all the details.

(800) 343-6474  
(In MA., 508/879-0700)

**9370's**  
That's All  
We Do!

From 20's to 90's  
Most Machines,  
Peripherals &  
Features

**IN STOCK**

Call us for a quote  
708-831-1255

Executive Infosource  
1530 Eastwood Ave., # 100  
Highland Park, IL 60035

Member  
Computer Dealers  
& Lessors Association

New/Reconditioned  
**digital IBM**

Equipment

Whatever your re-  
quirements are for Digital  
& IBM Equipment,  
call CSI first! Buying, sell-  
ing, trading, leasing, con-  
signments - we do it all!

CSI sells all equipment  
with a 30 day unconditional  
guarantee on parts and labor  
and is eligible for DEC or  
IBM maintenance.

Offering systems, disk  
drives, tape drives, printers,  
terminals, memory, options,  
boards, upgrades and many  
more.

CSI Compurex  
Systems, Inc.  
83 Eastman St.  
Easton, MA 02334  
Call Toll-Free  
1-800-426-5499  
In Mass. (508) 230-3700  
FAX (508) 238-8250

GTEX  
FINANCIAL  
GROUP, Inc.

**IBM**

BUY SELL  
LEASE

PS/2 OPERATING  
LEASES

3084 3090  
PERIPHERALS

OEM/PCM  
LEASES

800-888-7568  
FAX 214/783-1379

Member  
CDLA EST.  
1978

**For Sale**  
4381-R24  
32 Meg.  
12 Chan.  
IBM M/A  
Avail 8-10-90  
714-279-2700

Ask for Dave

**Obsolete  
Computer Agent**

Your Travel Agent In  
Obsolete Electronic  
Equipment Removal

Contact:  
James Snowberger II

ONTARIO INVESTMENTS, INC.

315-682-8585  
Telecopy: 315-682-7007

Member  
Computer Dealers  
& Lessors Association

**FOR SALE**

Univac 1100/72  
W/Peripherals  
Sell - Lease

Call Ron

708-920-0689

First Financial Leasing  
120 E. Ogden Ave., Ste 212,  
Hinsdale, IL 60521-3546

**CLASSIFIED  
MARKETPLACE**

Where Computer  
Professionals Shop

(800) 343-6474  
(in MA; 508/879-0700)

**IBM**

Member  
Computer Dealers  
& Lessors Association

CDLA

**BUY · SELL · LEASE**

9370  
4381

SYSTEM  
36/38

AS/400

POINT  
OF  
SALE

SERIES  
1

• Processors  
• Peripherals  
• Upgrades

**DEMPSEY**

ASSOCIATES  
Inc.

18377 Beach Blvd., Suite 323  
Huntington Beach, CA 92648 (714) 847-8486

(800) 888-2000

**Computerworld's**

**Classified  
Marketplace**

showcases  
your ad by  
product category!

Whether it's used equipment, soft-  
ware, time, services or just about  
any other category of computer  
product or service, *Comput-  
erworld's* Classified Marketplace is  
organized to make your ad visible  
and to make buying your product  
easy.

**Just look!**

**Computerworld's  
Classified Marketplace  
Product Categories**

software  
hardware  
conversions  
PC products  
time/services  
buy/sell/lease  
communications  
peripherals/supplies  
business opportunities  
bids/proposals/real estate  
graphics/desktop publishing

So if you're selling computer prod-  
ucts or services, advertise in the  
newspaper that showcases YOUR  
product or service. Advertise in  
*Computerworld's* Classified Mar-  
ketplace!

**For more  
information, call**

**800/343-6474**  
(in MA, 508/879-0700)

**HP HP HP HP**

**NEW and USED**  
1000 • 3000 • 9000  
Including Spectrum

BUY • SELL • TRADE • RENT • LEASE  
Processors • Peripherals • Systems

All in Stock - Immediate Delivery

All warranted to qualify for manufacturer's maintenance

**ConAm Corporation**

It's Performance That Counts!  
800/643-4954 213/829-2277  
FAX 213/829-9607

**Associates inc**

- Data General
- Fujitsu
- Data Products
- CDC
- Printronix
- Zetaco

**BUY SELL  
TRADE**

617/982-9664

FAX:  
617/871-4456

BUY • SELL • LEASE

**AS/400  
S/38, 36, 34  
SERIES 1**

SYSTEMS  
PERIPHERALS  
UPGRADES

SOURCE DATA  
PRODUCTS

19762 MacArthur Blvd.  
Irvine, CA 92715

(714) 851-1970  
(800) 333-2669

**WE WILL BUY**

★ SYSTEMS OR PARTS ★  
AS IS OR REFURBED

IBM

14XX 29XX 30XX  
40XX 50XX XT AT PS2  
Token Rings

Apple Compaq Clones

Drives Seagate Tandon

Please call the  
"Offer Desk"

Computer Service  
Supply Corp.

1-800-255-7815

In N.H. (603) 437-0634  
Fax: (603) 622-0128



The Computer Parts Vault

**PRIME**

EXPERIENCED  
SYSTEMS AND  
PERIPHERALS

BUY-SELL-LEASE  
BROKERAGE

NEW PLUG-COMPATIBLE  
DISK, TAPE, MEMORY

PLUS  
THE FASTEST I/O  
AVAILABLE ANYWHERE

1ST SOLUTIONS, INC.  
11460 N CAVE CREEK RD  
PHOENIX, AZ 85020

ASK FOR DON SHIFRIS

602-997-0997  
Fax: 602-997-1688

Member  
Computer Dealers  
& Lessors Association

**CALL US LAST**

GET YOUR BEST PRICE  
THEN CALL

**COMPUTER BROKERS, INC.**

WE

Buy - Sell - Lease

New and Used IBM Equipment  
AS400 - System 36, 38, 43XX

**SHORT TERM RENTALS**

Call 800-238-6405  
IN TN 901-372-2622

Member  
AMERICAN  
SOCIETY OF  
COMPUTER  
DEALERS

**COMPUTER BROKERS, INC.**

2978 Shelby St., Memphis, TN 38134

'Since 1974'

BUY • SELL • LEASE • NEW • USED  
PERIPHERALS • SYSTEMS • UPGRADES

**ICE LTD.**  
INTERNATIONAL COMPUTER  
EXCHANGE LTD.

1-800-ICE-BUYS

**digital**

Data General

**SUN**

**apollo**

**IBM**

PC/AT/PS2

**RECONDITIONED  
COMPUTER EQUIPMENT**

VAX 3100...Mod 40  
NEW.....\$18,000

IBM Mem Upgrades  
NEW/Boxed...\$400 &  
Up

SUN 3/50...M4  
NEW.....\$2,000

INTEL.....82380-20  
INTEL.....80486-25

APOLLO DN2500  
NEW.....\$9,500

KDJ11-BF..11/84 CPU  
MSV11-JE...2 MB -  
11/84

- Call today for quote -  
**1-800-ICE-BUYS**

INTERNATIONAL COMPUTER EXCHANGE, LTD.  
TEL.: (617) 585-8888 • FAX: (617) 585-9177  
• 183 MAIN ST. • KINGSTON, MA 02384 •

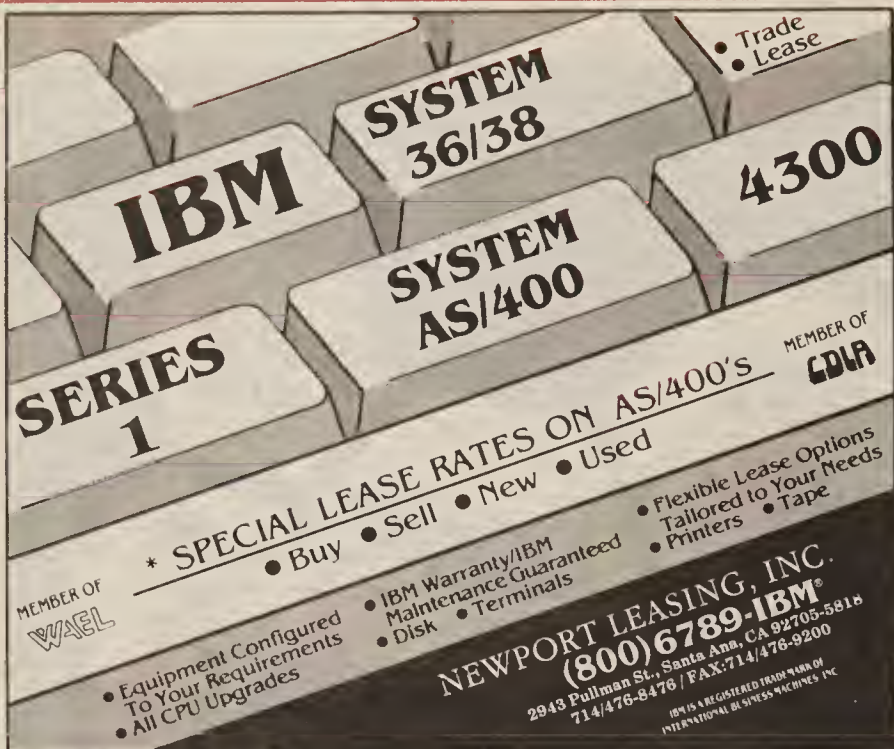
**WE BUY and SELL**  
NEW - USED - AS IS  
APOLLO, DEC, HP, SUN, WANG  
CDC, MAXTOR, MICROPOLIS  
Fax us your excess listings  
Call us for current inventory on above

**Industrial  
Electrosurplus**

Tel (508) 788-3480  
FAX (508) 788-3479



**Buy/Sell/Lease**



**IBM**  
**SYSTEM 36/38**  
**SYSTEM AS/400**  
**SERIES 1**  
**4300**

• Trade Lease  
• Flexible Lease Options Tailored to Your Needs  
• Printers • Tape  
• IBM Warranty/IBM Maintenance Guaranteed  
• Disk • Terminals  
• Equipment Configured To Your Requirements  
• All CPU Upgrades

**\* SPECIAL LEASE RATES ON AS/400's**  
• Buy • Sell • New • Used

**MEMBER OF Wael**  
**MEMBER OF ADIA**

**NEWPORT LEASING, INC.**  
**(800) 6789-IBM**  
2943 Pullman St., Santa Ana, CA 92705-5818  
714/476-8476 / FAX: 714/476-9200  
IBM IS A REGISTERED TRADEMARK OF INTERNATIONAL BUSINESS MACHINES INC.

**RENT YOUR COMPUTER POWER FROM A POWERFUL RENTAL COMPANY**

**Workstations - PC's - Laptops - Peripherals**



**IBM, Sun, Compaq, Apple, HP, DEC, Toshiba and TI**  
**Short Term Rentals, Term Leases, Used Sales**

- World's Largest Inventory - Over \$220-million
- Inventory Centers Nationwide

For information on your closest inventory center call:

**Electro Rent Corporation**

**1-800-444-4964**

**IBM SPECIALISTS**

**SELL • LEASE • BUY**

**S/34 S/36 S/38 AS/400**  
**3741 3742**

- New and Used
- All Peripherals
- Upgrades and Features
- IBM Maintenance Guaranteed
- Immediate Delivery
- Completely Refurbished

**800-251-2670**

IN TENNESSEE (615) 847-4031



PO BOX 71 • 610 BRYAN ST. • OLD HICKORY, TN 37138

**VAX RENTALS**

**MV 3600**  
**MV 3800/3900**  
**VAX 6000 SERIES**  
**VAX 8000 SERIES**  
**Systems & Peripherals**

- Fast Turnaround
- Dependable Products
- Upgrade/Add-On Flexibility

• 6 Months • 12 Months • 24 Months

**BROOKVALE ASSOCIATES**

Member Computer Dealers & Leasing Associates

**EAST COAST (516) 273-7777**

**WEST COAST (206) 392-9878**

**HONEYWELL**  
**LEVEL 6 DPS 6**  
**SERIES 16**

- Complete Minicomputer Line -- New & Used
- All Peripherals & Terminals
- Upgrades and Features
- Depot Repair Capability
- Honeywell Maintenance Guaranteed
- Immediate Delivery Low Prices
- HDS 5 and HDS 7 Compatible Terminals

The Recognized Leader in Honeywell Minicomputer Sales and Support



**BOUDREAU**  
**COMPUTER SERVICES**

**100 Bearfoot Road**  
**Northboro, MA 01532**  
**(508) 393-6839**  
**FAX 508-393-3781**

**"Since 1974"**

Buy **RT** Sell

**RS/6000**  
**SERIES/1**  
**3X,AS/400**  
**937X**  
**4300**

Lease Rent

Currently replacing Series/1's with the new RS/6000 line via EDX to AIX migration

**612-942-9830**

**DATATREND**

10250 Valley View Road  
Suite 149  
Eden Prairie, Minnesota 55344

**Buying Selling**

**DEC • SUN**  
**Data General**  
**Plus**  
**All Peripherals**

**Call DCC**

**617-837-7255**  
**or**  
**301-750-7200**

**For Sale**

**3380-AK4**  
**3380-BK4**  
**3480-A22**  
**3480-B22**

**Avail. 8-10-90**

**IBM M/A**

**714-279-2700**

**Ask for Dave**

**Bids/Proposals/Real Estate**

**REQUEST FOR PROPOSALS**

This is a correction to the ad for the RFP for qualified firms to design, develop, install and maintain microcomputer LAN applications.

The RFP is for **COMPUTER SYSTEM ANALYSIS AND DEVELOPMENT**.

The New York City School Construction Authority (SCA) is seeking proposals from qualified firms to design, develop, install and maintain microcomputer applications.

A pre-bid conference will be held at 29-10 Thomson Avenue, Long Island City, 1st floor bid room at **10:00 a.m. on August 2, 1990**. Interested proposers may pick up copies of the request for proposals as of July 18, 1990 at the aforementioned location which are due no later than **2:30 p.m. on August 9, 1990**.



**NEW YORK CITY SCHOOL**  
**CONSTRUCTION AUTHORITY**  
29-10 Thomson Avenue  
Long Island City, NY 11101

Be advised that Proposers must be prequalified to do business with the SCA. Prequalification Forms may be obtained by contacting Harry Felder at (718) 472-3161.

**PC Products**

**Memory Upgrades**

<b>IBM PS/2</b> 2 MB Module Model 70, 65SX, 50Z, 55SX	\$235	<b>5 Year Warranty</b>
<b>COMPAQ</b> 1 MB Module Desk Pros	\$145	
<b>DEC</b> Vax Station Dec Station	Call	



**1-800-688-8993**

**SPECIALIZED SYSTEMS TECHNOLOGY**

**612,000**

**IS/DP**

**Professionals see the**

**CLASSIFIED MARKETPLACE**

each week. Call for advertising information:

**(800) 343-6474**  
(In MA., 508-879-0700)

**Advertise Your Products In The**

**Classified Marketplace**

**Featuring**

- ☐ Buy/Sell/Lease
- ☐ Software
- ☐ Conversions
- ☐ Time/Services
- ☐ Business Opportunities
- ☐ Bids/Proposals/Real Estate
- ☐ Hardware
- ☐ Peripherals/Supplies
- ☐ Communications
- ☐ PC Products
- ☐ Graphics/Desktop Publishing

Reach over 612,000  
information systems professionals  
by placing your company's message in  
**Classified Marketplace.**

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Company: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_

State: \_\_\_\_\_ Zip: \_\_\_\_\_

Telephone: \_\_\_\_\_

Ad Size: \_\_\_\_\_

\_\_\_\_\_ columns wide x \_\_\_\_\_ inches deep.

☐ I am enclosing ad material with this form.

Return this form and advertising material to:

**Computerworld**  
**Classified Marketplace**

375 Cochituate Road, Box 9171  
Framingham, MA 01701-9171

**(800) 343-6474**  
(In MA., (508) 879-0700)

**WANTED: MANUFACTURING SYSTEM SOFTWARE**

We are looking for a manufacturing software package which includes integrated modules for multi-divisional financial accounting, payroll, accounts payable, purchasing, inventory control, sales order entry, billing, accounts receivable, sales analysis, production order entry including routing and bills of material, production and materials tracking, job cost accounting, and job scheduling. The software must be proven to the extent that there are at least a couple of installations which utilize all of the modules.

Our product is produced from stock materials as well as special order materials, and typically passes through several manual and machine operations. We have some jobs which are produced and shipped within hours and some which are produced and shipped over a 12 month period. We must have the ability to track prepayments on selected order items and the ability to do partial billings on selected order items. We must schedule all jobs other than same day shipments and be able to track the progress on those jobs. We must track costs on all jobs.

The purchasing, inventory, payment, and usage of materials and outside contractor services must be integrated with accounts payable and job order tracking.

Some product inventory must be tracked by serial number and whether it is in finished goods, in a branch sales office, or in the hands of our customer.

It is our intention that the software applications be installed "as is" on our targeted day one; however, it must include source code so as to allow us to make ongoing modifications in the future. We intend to support the system and the applications internally and thus require facilities for training our own staff prior to delivery of hardware. That training must include training in the system software, application languages, and the user interface.

**HARDWARE**

The hardware which the software requires must have a proven track record for reliability. It must be capable of supporting 75-100 active workstations and 12-25 printers, local and/or remote. It must have the capability of being easily upgraded with respect to memory capacity and additional peripherals.

**GENERAL**

We are looking for software which has user friendly data entry and inquiry interfaces, updates data files on-line (as opposed to batch), and retains time stamped detail transaction files (subject to periodic purging). The order entry module should have the capability of prompting the order process while the sales person is on the telephone with the customer, and allow the sales person to inquire into customer account status and job order status.

Address information to:

Dept J  
PO Box 2108  
North Canton, Ohio 44720

**Your used computer equipment deserves a second chance.**

If you have used computer equipment to sell, *Computerworld's* Classified Marketplace is the best place to do your selling. That's because the Classified Marketplace features a Buy/Sell/Lease section to help you market your equipment to the very people who are looking to buy.

And when you advertise in *Computerworld* Classified Marketplace, you reach a total (ABC-audited) audience of over 612,000 computer professionals who turn to *Computerworld* for news, information, features - and the Classified Marketplace - every week.

So give your used computer equipment a second chance today.

To reserve your space, call:

**800/343-6474**  
(in MA, 508/879-0700)

## Business Opportunities

### UK DISTRIBUTION

Applications Development Tools, Case Tools, Project Management, DB2 Tools.

A successful group which is achieving major success selling to the top IBM users in the UK is looking for more products to market on an exclusive basis in the UK.

If you have products in the above areas then please write to the address given below or fax initial information to: 011 44 276 51660

**Systems Innovation**  
7 Tanners Yard  
Bagshot Surrey GU19 5HD

## Graphics/Desktop Publishing

### Computerworld's

#### Classified Marketplace

needs only  
3 days notice  
to run your ad!

Call:

**(800) 343-6474**  
(in MA: 508/879-0700)

### PC SCREEN TO BIG SCREEN

Look to **BOXLIGHT** for the Largest Selection of LCD Pads

**TRUE COLOR  
SYSTEMS from \$4995  
MONOCHROME  
SYSTEMS from \$599**

Solutions for VGA, EGA, CGA  
All Macs, DEC VT 100s, 220s  
IBM Terminals and More

**BOXLIGHT  
CORPORATION**

VISA, M/C, AMEX, COD **206/697-4008**  
Computer-Based Presentation Systems Since 1984

## Software

### It's the Classified Marketplace

Reach Computer  
Professionals  
Where They  
Shop For:

- ☐ Buy/Sell/Lease
- ☐ Hardware
- ☐ Software
- ☐ Peripherals/Supplies
- ☐ Communications
- ☐ Graphics/Desktop Publishing
- ☐ Time/Services
- ☐ Bids/Proposals/Real Estate
- ☐ Business Opportunity

CALL NOW

**800-343-6474**  
(in MA., 508/879-0700)

### NEW!

PC based SST-ANALYZER  
audits, documents and  
inventories your appli-  
cation programs. Var-  
ious architectures,  
languages, databases.

- Reduce  
Maintenance Costs  
& Backlog
  - Prepare for  
AD/Cycle, Migration  
& Re-engineering
- ACT, Inc.**  
**(609) 646-7856**

Go Shopping in...  
Computerworld's  
**CLASSIFIED  
MARKETPLACE**  
Call for all the details  
**(800) 343-6474**  
(in MA., (508) 879-0700)

### FREE BUYER'S GUIDE

When you need programmer's development tools, Programmer's Connection is your best one-stop source. We are an independent dealer representing more than 400 manufacturers with over 1200 software products for IBM personal computers and compatibles including: COBOL compilers and utilities, relational databases, and much more. Call today to receive a FREE comprehensive Buyer's Guide, and find out why Programmer's Connection is your best connection for software tools.

Programmer's Connection  
7249 Whipple Ave NW  
North Canton, Ohio 44720  
US ..... **800-336-1166**  
Canada ..... 800-225-1166  
International... 216-494-3781  
FAX ..... 216-494-5260

## Computerworld's Classified Marketplace

gives you reach to over  
612,000 potential buyers!

And this audience is even verified by the Audit Bureau of Circulations in the only independently audited pass-along survey of its kind. What's more Computerworld's Classified Marketplace penetrates buying companies in all major industries. That's because Computerworld's total audience blankets key vertical markets that are major users -- and major buyers -- of computer products and services.

So if you're selling computer products and services, advertise in the newspaper that delivers over 612,000 potential buyers. Advertise in *Computerworld's* Classified Marketplace!

For more  
information, call:

**(800) 343-6474**  
(in MA, 508/879-0700)



## Time/Services

**CORPORATE DISK COMPANY™**  
CD TECHNOLOGIES INC. • CD MARKETING INC.



### TAPE AND DISKETTE DUPLICATION

**"THE ONE STOP SHOP FOR  
SOFTWARE DEVELOPERS"**

**STOP** going to 5 different  
suppliers! It can all be done  
with one easy phone call.

Our Services Include:

- Special Silk Screening Process for 3 1/2" and 5 1/4" Diskettes. We can print right on the shutter of each 3 1/2" disk or right on the jacket of 5 1/4" disks!!
- Printed Diskette Sleeves
- Printed Diskette Labels
- Printed Binders & Slipcases
- Printed Documentation Pages
- Duplication Equipment
- Low Cost Diskettes

"You have to make but one phone call to the Corporate Disk Company and can consider the job done."

In Illinois (708) 439-DISK  
Nationwide 1 (800) 634-DISK

© 1989 by CD Marketing Inc.

### REMOTE COMPUTING OUTSOURCING

- MVS/XA
- CICS
- DB2
- VM/370
- TSO
- IMS/DBDC
- DOS/VSE
- CMS

OVER 150 SOFTWARE PRODUCTS

- DEVELOPMENT
- PRODUCTIVITY
- DEBUGGING
- PERFORMANCE

- TELENET
- SEARSNET
- TYMNET
- IBM INFORMATION NETWORK

EXTRAORDINARY CUSTOMER SERVICE  
MIGRATION MANAGEMENT

**GIS** INFORMATION  
SYSTEMS, INC.

815 Commerce Drive, Oak Brook, IL 60521

**708-574-3636**

New England  
**617-595-8000**

### SUNGARD

COMPUTER SERVICES

OUTSOURCING EXPERTISE

FIXED PRICE COMPUTING

ECONOMICAL PRICES - SIGNIFICANTLY LESS THAN  
IN-HOUSE

IBM 3090 COMPUTERS WITH MVS/ESA, AND VM  
TECHNOLOGY

EXTENSIVE NATIONWIDE TELCOM NETWORK

EXTENSIVE LIBRARY OF THIRD PARTY SOFTWARE

PROFESSIONAL SERVICES FOR APPLICATION  
SUPPORT & DEVELOPMENT

FOR MORE INFORMATION CALL:

(800) 441-4203 (215) 387-3890  
(212) 943-9540

**SUNGARD COMPUTER SERVICES INC.**  
1285 DRUMMERS LANE  
WAYNE, PA 19086

### OUTSOURCING-PROCESSING SERVICES

MVS/TSO - VSE - VM/CMS - CICS - ISPF - VTAM  
SQL - DB2 - QMF - SAS - Laser Printing

- Top Management Involvement With Every Account
- Low Cost Provider In Los Angeles



**PYRAMID**

call: Stan Feinstein, Exec. V.P.

**800-899-5178**

Pyramid Information Services, Inc.

## COST-EFFECTIVE COMPUTING SERVICES for TODAY and.... TOMORROW

**COMDISCO COMPUTING  
SERVICES CORP.**

Provides you with:

**REMOTE COMPUTING  
COMPUTER OUTSOURCING  
FACILITY MANAGEMENT**

Featuring:

- IBM® CPUs and Peripherals
- Systems Software:  
MVS/XA, TSO/E, ISPF/PDF,  
CICS, VM/XA, VM/SP, HPO, CMS
- Application Software:  
Database Management  
Application Development  
4/GLs Graphics  
Statistical Analysis
- Multiple Communications  
Methods
- Technical Support
- Automated Tape Handling
- ULTRA-Secure Data Center
- Advanced Laser Printing
- Pricing to fit your needs

Call: Robert Marino  
**201-896-3011**

**COMDISCO**

**COMDISCO COMPUTING  
SERVICES CORP.**

430 Gotham Parkway, Carlstadt, NJ 07072

# VAX SERVICES

### TRAINING, INSTALLATION, SALES AND SUPPORT

- Wordperfect 5.0 for VAX/VMS
- Wordperfect "Office" for VAX/VMS
- Wordperfect PlanPerfect for VAX/VMS
- Wordperfect All-in-One Integration
- Wordperfect upgrade 4.2 to 5.0
- VMS System Management
- VMS Installation

### EXPERTS IN:

- Office Automation/Feasibility Studies
- Document Management Systems
- VAX/VMS, Novell
- Networking, VAX - PC Connectivity

- INSTALLATION
- SOFTWARE DEVELOPMENT
- DATA CONVERSION
- HARDWARE MAINTENANCE
- DATA WIRING  
(Unshielded Twisted Pair, Thin Wire, ETC.)
- TIMESHARING
- SITE SUPPORT/OUTSOURCING
- EXECUTIVE PLACEMENT

**Omnicomputer, Inc**  
1440 Broadway  
New York, NY 10018

Tel. (212) 944-9230  
Fax. (212) 869-2846

**Time/Services**

# MCN Computer Services

*is your link to perfection.*

State-of-the-art  
IBM compatibility:

MVS-ESA \* VM/XA \* TSO/E \*  
ROSCOE \* CICS \* IMS \*  
IDMS/R \* DB2 \* QMF \*  
PROFS

Programmer productivity  
aids:

FILE-AID \* CICS PLAYBACK \*  
dBUG-AID \* ABEND-AID \*  
CICS \* ABEND-AID

At MCN Computer Services, we provide outsourcing solutions to major international clients. With one of the finest computer facilities in the country, your data is secure, yet readily available to you. Our high-quality, cost-effective services include:

- Operations 7 days a week, 24 hours a day
- Network Management



**MCN**  
Computer  
Services, Inc.

For more information, call Lisa Walker at:

**1-800-521-0444**

5225 Auto Club Drive  
Dearborn, Michigan 48126

## Quality Outsourcing

**We Match Any Reasonable Offer**

- ◆ IBM Mainframe/Peripherals
- ◆ Full Technical Support
- ◆ 24 hour Help Desk w/ 800#
- ◆ Database Conversions
- ◆ Automated Print Distribution
- ◆ S/38 Disaster Recovery
- ◆ Consulting Services
- ◆ Network Specialists
- ◆ Capacity Planning
- ◆ Automated Operations
- ◆ Laser Printing

**Resources Available Include:**

MVS/XA, VM/XA, CMS, CICS, DB2/QMF, TSO/E,  
ISPF/PDF, SAS, Librarian, IBM IN, PANVALET,  
EASYSREIVE, Telenet/Tymnet, TOP SECRET



**Call: (201) 216-3216**

INFORMATION TECHNOLOGY ALLIANCE CORPORATION

## ICOTECH



MVS/XA  
TSO/ISPF/SDSF  
CICS  
ADABAS  
LIBRARIAN

VTAM  
FILE-AID  
INTERTEST  
SAS  
\$AVRS

DB2  
SIMWARE  
ACF2  
ADC2

- 24 hour availability
- International access
- Superior technical support staff
- Impeccable service
- Uninterrupted Power Supply
- Certified on-site vault
- Disaster recovery

**Call Now - Solve Your Computing Worries**

**TODAY & TOMORROW!**

**(201) 685-3400**

### NEW & USED RAISED FLOORING

**Immediate  
Delivery**

**Quality  
Installation**

**Raised  
Computer Floors**  
One Charles Street  
Westwood, NJ 07675

**(201) 666-8200  
FAX (201) 666-3743**

### REMOTE COMPUTING

• We locate COMPUTER  
TIMESHARING, includ-  
ing OUTSOURCING on  
ALL mainframes.

• Since 1968 we have  
found your LOWEST  
prices from over 800  
nationwide data  
centers.

• NEVER a charge to the  
Buyer, because our fee  
is paid by the Seller.

**CALL DON SEIDEN AT  
COMPUTER  
RESERVES, INC.**

**(201) 882-9700**

### Computerworld's

#### Classified Marketplace

**needs only 3  
days notice to  
run your ad!**

When you're selling, you want your advertising to hit the market quickly and frequently. You can't afford to wait for an issue that's coming out several weeks - or months - into the future. With Computerworld, there's no waiting for the next available issue because we've got one for you every week. What's more, your ad can appear in the Monday issue of Computerworld if you order just 3 days prior to the issue. Advertise in the newspaper that won't keep you waiting. Advertise in Computerworld's Classified Marketplace!

**For more  
information,  
call:**

**800/343-6474**  
(in MA, 508/879-0700).

## Outsourcing... When Time, Capital And Quality Count

Litton Computer Services frees you from the day-to-day grind of data center management... so you can concentrate on your business.

Cost-effective, fixed-price solution to in-house computing with the resources and expertise necessary to fit your needs.

- Multiple Data Centers
- Large-Scale Information Systems
- Nationwide Network
- Remote Facilities Management
- Migration Specialist
- Operating System Conversions
- Integrated Financial Systems
- Major third Party Software Packages

Contain your costs without losing control...

**CALL 1 800 PLAN LCS.**

**(1 800 752-6527)**

**Litton**

Computer Services

### Conversions

#### CONVERSION EXPERTS

Family of integrated software tools that automate the following conversions:

- DOS to MVS
- DOS/MVS to AS400
- Honeywell to IBM
- CICS Macro to Command
- Any Cobol to Any Cobol
- Basic to Cobol

Products & services on your site or ours. Fixed fee or T&M.



**NEOSYNETICS, INC.**  
2860 Des Plaines Ave., Suite 375  
Des Plaines, Illinois 60018  
708/299-0900 Fax: 299-6044

When it's time to get  
**SERIOUS**  
about document and data  
**CONVERSION**

MMC has the skill and experience to help you get from old system to new quickly and cleanly. This industry pioneer provides both service bureau and in-house conversion solutions. The firm's R&D has produced many unique and unusual capabilities. Large and technically challenging projects are a specialty.

**"We do the tough ones!"**

**Muller Media Conversions, Inc.**  
32 Broadway, New York, NY 10004  
(212) 344-0474 fax: (212) 968-0789

### CONVERSION SPECIALISTS

**AUTOMATED  
CONVERSIONS  
TAILORED  
TO YOUR NEEDS**

DOS TO MVS  
HONEYWELL TO IBM  
MACRO TO COMMAND  
RPG TO COBOL  
ASSEMBLER TO COBOL  
PL1 TO COBOL  
OTHER LANGUAGE/  
SOFTWARE  
CONVERSIONS

**BELCASTRO  
COMPUTER SERVICES**  
120 MILLCREEK RD.  
NILES, OH 44446  
**(800) 521-2861**

### It's the Classified Marketplace

Reach Computer  
Professionals  
Where They  
Shop For:

- ☐ Buy/Sell/Lease
- ☐ Hardware
- ☐ Software
- ☐ Peripherals/Supplies
- ☐ Communications
- ☐ Graphics/Desktop Publishing
- ☐ Time/Services
- ☐ Bids/Proposals/Real Estate
- ☐ Business Opportunity

**CALL NOW  
800-343-6474**  
(in MA, 508/879-0700)

### Peripherals/Supplies

#### 9-Track Tape For Your IBM PC/XT/AT/PS-2™



Read 1600 or 6250 bpi  
9-track tapes from a micro,  
mini or mainframe in EBCDIC  
or ASCII as mirror image or  
by individual files.

Use the 2000 PC™ for  
disk backup, data inter-  
change or archival storage.  
PC/XT/AT/PS-2 are trademarks of IBM.



**DIGI-DATA CORPORATION**  
8580 Dorsey Run Road  
Jessup, MD 20794-9990  
(800) 782-6395  
FAX (301) 498-0771

### Computerworld's

#### Classified Marketplace

delivers your  
message in  
companies that  
plan to buy  
your product  
or service.

From PCs to minis, mainframes to super-computers, Computerworld's readers buy products across all ranges of today's computers. So if you're selling, advertise in the newspaper that delivers readers that plan to buy YOUR product or service. Advertise in Computerworld's Classified Marketplace!

**For more  
information,  
call:**

**800/343-6474**  
(in MA, 508/879-0700).

### Computerworld's

#### Classified Marketplace

**gives you buyers  
with extensive  
purchase influence.**

In fact, a full 95% are involved in purchase decision making for their organizations. They determine needs, evaluate technologies, identify solutions, and select products and vendors for the entire range of information systems, as well as related products and services.

So if you're selling computer products and services, advertise in the newspaper that delivers buyers with volume purchasing influence. Advertise in Computerworld's Classified Marketplace!

**For more  
information, call**

**(800) 343-6474**  
(in MA, 508/879-0700).

## Building a computer teacher

*Innovative tools let teachers create their own computer-aided instruction*

BY CHARLES P. LECHT  
SPECIAL TO CW

**L**et's face it: Until now, the sensory experience of computer-aided instruction (CAI) has been limited. We hear a few robotic sounding words and whiny beeps, both of which soon become more of an annoyance than a help. As for graphics, what we view is hardly more than what an ill-prepared teacher might write on a chalkboard.

To date, most CAI programs have been a bore. The exceptions often involved expensive technology that most people could not afford. Some companies have created credible courses, but too frequently the programs are the subsidized offspring of other money-making endeavors. We are still waiting for the day when we can routinely unwrap a training program as we do a new spreadsheet program, load it into a personal computer and begin an enjoyable learning experience.

The major obstacle to effective CAI is not technology. It is

the difficulty of writing scripts that don't require a teacher to be present during study to explain things and to motivate the student.

It should come as no surprise that this problem defies a straightforward technological solution. Just as word processors do nothing to help an author devise a good plot, CAI authoring systems offer little assistance in the creative aspects of designing a course. Despite an awareness of this situation, many companies assign the preparation of CAI programs to people who aren't qualified in these creative areas.

This lack of respect for content is aggravated when companies develop CAI programs for courses that have not been taught in the classroom. In CAI, overcoming the technical problems is a big enough chore; trying to design new roads without a map is too much to take on. Companies should not try to develop CAI programs where there is no

classroom experience with the material involved.

The issue of CAI authoring languages also rears its ugly head. Most of the ones that I've seen are awful. They suggest that their creators have had too much experience at programming and not enough at teaching. They discourage the educated and creative scriptwriter from helping prepare a course. Instead, they encourage the involvement of people skilled at the manipulation of programming symbols. Indeed, many companies hire CAI scriptwriters for their understanding of an authoring language rather than

teaching acumen. The result is programs that emphasize style and minimize substance. Given these problems, there seems to be no substitute for a human teacher. However, there is some hope for improvement in CAI in the immediate future. The problems of hardware technology and authoring languages

are well on their way to being overcome in today's computer world.

The stage has been set for a quantum leap in CAI quality by two developments: the latest increases in processing power of relatively inexpensive desktop computers and the emergence of readily available, off-the-shelf multimedia boards for them.

There are sound boards that allow capture and storage of voice and music onto a hard disk. The boards replay the sounds through standard speakers that can be found just about anywhere. The memory capacity needed to store this sound is still too large, but it's just a matter of time before this obstacle will be overcome.

Then there's compact disc technology. For the moment, this technology is limited to read-only discs, but some companies have already developed rewritable optical discs and will announce their availability this year. Thus, today's sight-only systems will soon be augmented by sound.

There are also new video capture boards that let a computer store full-motion video on a hard disk and replay it on today's high-quality computer displays. This video footage also takes up too much memory; again, how-

ever, it's only a matter of time before this situation will be improved.

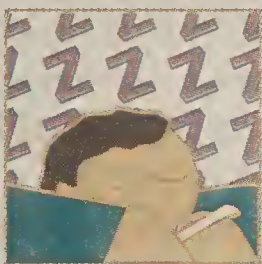
With these technological developments, we will see substantial improvement in CAI graphics through the use of recently developed graphics tools. Companies will create great charts, pictures and even movies that they can store and re-call for use in CAI courses.

With the problems of sound and sight overcome, we only have to deal with the authoring language. It isn't surprising that this software technology lags far behind the hardware. However, this shouldn't be the case for long.

Today's icon-driven office systems offer a clue to the future of CAI authoring systems. The complicated coding and spreadsheet scheduling that characterize today's authoring systems will give way to the simple selection of icons on a screen in a process familiar to creators of educational materials.

With this development, we will overcome most of the problems hindering CAI. There's a bright future for CAI users and an even brighter one for good educational scriptwriters.

Lecht is an IDG News Service correspondent based in Tokyo.



## COMPUTERWORLD

August

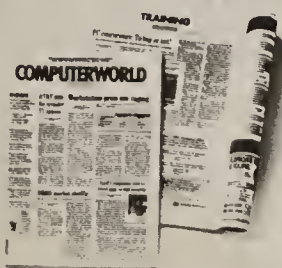
Training

Editorial Topics

**13** Teaching presentation skills.  
*Product Spotlight:*  
Storage Technologies  
*Ad Close:* August 7

**20** Developing a marketing plan for IS training.  
*Executive Report:*  
How IS Can Help Companies Cope with Workforce Changes  
*Ad Close:* August 14

**27** Training and the introduction of 4GLs.  
*Product Spotlight:*  
Data Center Automation  
*Ad Close:* August 21



SEMINAR

### "Data Center Planning & Design"

Oct. 1 & 2, 1990, Guest Quarters, Phila Airport

This two-day non-commercial seminar for MIS, DP and Facilities Planning professionals provides a guide on how to plan, design, survey, budget and build an effective data center on-time, under budget and without extras! You receive a 400-pg "Planning & Design" manual containing checklists, product comparisons, charts and budget figures.

• Comprehensive planning • Finding qualified A/E • Budgeting figures  
• 27 critical design steps • Disaster prevention • Common mistakes  
• Requirements Report • Support facilities • Move planning  
• Project management • Site evaluation • Design for growth

Call Grace, (609) 778-1475 for tuition/brochure.

The James Group, 5 Carriage Ct., Suite 101, Mt. Laurel, NJ 08054

Educate your customers through

Computerworld's

TRAINING Section.

Instructor-Led Mainframe Training and Development for IBM and related products.

**Interact**  
INFORMATION SERVICES, INC

914-332-6100  
(Within NYS)

800-628-5471  
(Outside NYS)

Computerworld's

Training Pages  
give you cost-effective reach!

That's because Computerworld's training Pages give you the most widespread reach available to management and staff in America's IS departments - the departments that directly control America's IS training dollars.

And for good reason Computerworld is the best read publication in America's IS departments - the departments that directly control nearly 80% of the \$233 billion US market for all ranges of computer software, hardware, data communications equipment, services and staff.

What's more Computerworld's Training Pages lead buyers to your ad with a weekly Training editorial feature that anchors the section and your ad. Whether it's topics like "Unraveling SQL for MIS pros," or "Finishing the training contract," Computerworld's Training Pages deliver pertinent, advice-oriented editorial to Computerworld's readers every week.

### The Ultimate Training Solution

40 to 60 hours of in-depth training per course. Lessons consist of objectives, lectures, examples with detailed explanations, exercises with the presentation of multiple solutions per problem and lesson reviews. Developed by professionals that have taught these courses to thousands of students. Courses currently available include:

- The UNIX Operating System, Utilities and Bourne Shell Programming
- The UNIX Operating System, Utilities and C Shell Programming
- The ANSI C Programming Language and Libraries
- Programming with QUICK C
- Programming with TURBO C
- INFORMIX/SQL Applications Development
- INFORMIX/4GL Applications Development
- Programming with ADA
- Programming with C-scape

Designed to be your personal video textbook, the price of each course is an affordable \$150, plus applicable sales tax. Check, VISA and MasterCard accepted

**Video Textbook Training**

200 Lakeside Drive, Building A4  
Morgantown, WV 26505

(304) 292-0917 FAX (304) 296-4032

UNIX is a registered trademark of AT&T  
INFORMIX/SQL and 4GL are registered trademarks of INFORMIX Software, Inc.  
QUICK C is a registered trademark of Microsoft Corporation  
TURBO C is a registered trademark of Borland International  
C-scape is a registered trademark of Oakland Group, Inc.

**Dr. James Martin  
Dr. Carma McClure**

Free Tutorials Vendors Exhibit Booths Additional Speakers

**CASE**

for the 1990s  
"The" CASE event of the year

- RAD™
- Re-engineering
- Repositories
- Reusability

Extended Intelligence, Inc.  
Registration Line - (312)-346-7090

**BOSTON**  
AUG. 27-29  
**SEPT. 17-19**  
**ATLANTA**

# “Our advertising in Computerworld’s Classified Marketplace generates high-quality leads from all corners of the world.”

— Leslie Klein  
President  
Eurodata Inc.



Eleven years of serious selling and servicing have made Eurodata Inc. of Ottawa one of the oldest Hewlett-Packard dealers in the world — and the largest third-party Hewlett-Packard maintenance organization in Canada. President Leslie Klein knows success like this doesn’t just happen. He knows the importance of finding and telling IS managers in organizations everywhere, both large and small, about Eurodata’s unique programs for buying, selling, renting, and leasing Hewlett-Packard equipment. And he knows from experience that these IS managers read *Computerworld’s* Classified Marketplace.

*“Our advertising goal is to reach all buyers and sellers of Hewlett-Packard computers, terminals, and peripherals. We want to tell them about our timely, cost-effective purchasing alternative. About our \$2 million inventory of the entire Hewlett-Packard computer product line — 1000, 3000, and 9000 series. About how we buy surplus equipment and refurbish everything to meet manufacturer standards for ongoing maintenance. About the first-hand knowledge our employees have of all products, no matter how old or new. About our exclusive service loaner arrangement that guarantees “up” time. And about our multi-faceted disaster recovery service.*

*“To accomplish this, we must reach information systems professionals — decision makers and sophisticated users — because they’re generally the most knowledgeable about requirements. I think Computerworld, having established itself as the most prestigious computer publication, goes out to the largest cross-section of readers, many of whom are managers and users of Hewlett-Packard hardware.*

*“Based on the nature of our equipment and the people we’re targeting, Computerworld’s Classified Marketplace is one of the most appropriate and economical places to advertise — and get results. Our advertising in Computerworld’s Classified Marketplace generates high-quality leads from all corners of the world.*

*“All in all, Computerworld’s Classified Marketplace gives us everything we need: cost-efficient reach to IS managers in multi-site environments worldwide. That’s why Eurodata Inc. is in Computerworld’s Classified Marketplace — and there to stay.”*

Computerworld’s Classified Marketplace. It’s where computer buyers meet computer sellers. Every week. Sellers and buyers like Eurodata Inc. who advertise in *Computerworld’s* Classified Marketplace because it reaches over 612,000 information systems professionals. And because it works. To put your classified message into the hands of America’s most powerful audience of buyers, call John Corrigan, Classified Advertising Director, at 800/343-6474 (in MA, 508/879-0700).



## COMPUTERWORLD CLASSIFIED MARKETPLACE

Where all computer buyers and sellers can go to market.

# ADVERTISERS INDEX

## SALES OFFICES

Publisher/Fritz Landmann

**Senior Vice-President/National Sales Director/**Kevin Harold, **COMPUTERWORLD**, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 **(508) 879-0700**

**BOSTON:** Regional Vice-President - North/David Peterson, Sr. District Managers/Bill Cadigan, Sherry Driscoll, District Manager/John Watts, Sales Assistants/Alice Longley, Lisa Bonaccorso, Linda Clinton, **COMPUTERWORLD**, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 **(508) 879-0700**

**CHICAGO:** Regional Vice-President - Midwest/Kevin McPherson, Senior District Manager/Larry Craven, Sales Assistants/Kathy Sullivan, Karol Lange, **COMPUTERWORLD**, 10400 West Higgins Road, Suite 300, Rosemont, IL 60018 (708) 827-4433

**NEW YORK:** Regional Vice-President - East/Bernie Hockswender, District Managers/Fred LoSapio, Paula D'Amico, Sales Assistants/Susan Kusnic, Patricia DeBlase, **COMPUTERWORLD**, Mack Center 1, 365 West Passaic St., Rochelle Park, NJ 07662 (201) 587-0090

**LOS ANGELES:** Regional Vice-President - West/Michela O'Connor Abrams, Southwest Regional Manager/Carolyn Knox, Sales Assistant/Bev Raus, **COMPUTERWORLD**, 18008 Sky Park Circle, Suite 145, Irvine, CA 92714 (714) 261-1230

**SAN FRANCISCO:** Regional Vice-President - West/Michela O'Connor Abrams, Senior District Manager/Emie Chamberlain, District Managers/Alicia Sarballis, Michele Genus, John J. Flood, Sales Assistants/Nurit Zekman, Chris Kobayashi, Carol Lacasse, Lisa Cremarosa **COMPUTERWORLD**, 500 Airport Boulevard, Suite 400, Burlingame, CA 94010 (415) 347-0555

**ATLANTA:** Regional Vice-President - East/Bernie Hockswender, District Manager/Melissa Christie Neighbors, Sales Assistant/Debra Brown, **COMPUTERWORLD**, 1400 Lake Hearn Drive, Suite 330, Atlanta, GA 30319 (404) 394-0758

**DALLAS:** Regional Vice-President - Midwest/Kevin McPherson, Southeastern District Manager/Darren Ford, Sales Assistant/Brenda Shipman, **COMPUTERWORLD**, 14651 Dallas Parkway, Suite 304, Dallas, TX 75240 (214) 233-0882

**WASHINGTON, D.C.:** Regional Vice-President - East/Bernie Hockswender, District Manager/Paula D'Amico, **COMPUTERWORLD**, Mack Center 1, 365 West Passaic St., Rochelle Park, NJ 07662 (201) 967-1350

## CLASSIFIED ADVERTISING SALES:

Classified Advertising Director/John Corrigan, Marketing Director/Derek E. Hulitzky, 375 Cochituate Rd., Framingham, MA 01701-9171 (800) 343-6474, In MA **(508) 879-0700**

## PRODUCT CLASSIFIED ADVERTISING:

**East:** Account Manager/Paul Bonamico, 375 Cochituate Rd., Framingham, MA 01701-9171 (800) 343-6474, In MA **(508) 879-0700**

**West:** Account Executive/Bill Creonte, 375 Cochituate Rd., Framingham, MA 01701-9171 (800) 343-6474, In MA **(508) 879-0700**

## RECRUITMENT ADVERTISING SALES OFFICES:

**New England:** Regional Manager/Nancy Percival, 375 Cochituate Rd., Framingham, MA 01701-9171 (800) 343-6474, In MA (508) 879-0700, Account Executive/Andrew Rowe, (800) 343-6474, In MA **(508) 879-0700**

**Mid-Atlantic:** Regional Manager/Valerie Galbo, Mack Center 1, 365 West Passaic St., Rochelle Park, NJ 07662 (201) 967-1350, Sr. Account Executive/Jay Novack, (800) 343-6474

**South-Atlantic:** Regional Manager/Katie Kress, 8304 Professional Hill Drive, Fairfax, VA 22031 (703) 573-4115, Sr. Account Executive/Pauline Smith (800) 343-6474

**Midwest:** Regional Manager/Pat Powers, O'Hare Corp. Twr 1, 10400 W. Higgins Rd., Ste. 300, Rosemont, IL 60018 (708) 827-4433, Account Executive/Ellen Casey (800) 343-6474

**West:** Regional Manager/Barbara Murphy, 18008 Skypark Circle, Ste. 145, Irvine, CA 92714 (714) 250-0164, Account Executive/Christopher Glenn (800) 343-6474

## DIRECT RESPONSE CARDS:

**East:** Account Manager/Norma Tamburino, Mack Center 1, 365 West Passaic St., Rochelle Park, NJ 07662 (201) 587-0090

**West:** Account Executive/Jill Halbert, 18008 Skypark Circle, Ste. 145, Irvine, CA 92714 (714) 250-0164

**IDG INTERNATIONAL MARKETING SERVICES:** Managing Director/Frank Cutitta, **COMPUTERWORLD**, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 **(508) 879-0700**

West Coast Marketing Manager/Leslie Barner, 3350 West Bayshore Road, Suite 201, Palo Alto, CA 94303 (415) 424-1001

## CW PUBLISHING/INC.

An IDG Company: The Worlds Leader in Information Services on Information Technology.

Fritz Landmann  
President & Publisher

Computerworld Headquarters: 375 Cochituate Road, P.O. Box 9171, Framingham, MA 01701-9171  
Phone: **508-879-0700**, Telex: 95-1153, FAX: **508-872-8564**

Val Landi  
Senior Vice-President  
Special Publications Division

Kevin Harold  
Senior Vice-President  
National Sales Director

Matthew Smith  
Senior Vice-President  
Chief Financial Officer

FINANCE Controller, Mark Sullivan.

SALES Advertising Director, Carolyn Novack. Vice President Classified Advertising, John Corrigan.  
Marketing Director, Derek E. Hulitzky.

Display Advertising Production Manager, Maureen Hanley. Classified Operations Manager, Cynthia Delany.

MARKETING Vice President/Business Development, Jan Harper. Manager, Marketing Communications, Mary Doyle.  
Account Manager, Marketing Communications, Elizabeth Phillips. Manager, Trade Show & Conventions, Audrey Shohan.

CIRCULATION Director of Circulation Management, Maureen Burke. Director of Circulation Promotion, Carol Spach.

PRODUCTION Vice President/Manufacturing, Leigh Hometh. Director of Publishing Technology, Carol Polack.  
Production Manager, Beverly Wolff.

PUBLISHER'S OFFICE Assistant to the President, Karen Elliott. Assistant to the Senior Vice-President, Nancy Gibbs.

## GLOBAL LEADERSHIP NETWORK

### FOREIGN EDITORIAL/SALES OFFICES

**ARGENTINA:** Ruben Argento, CW Comunicaciones S/A, Av. Belgrano 406-Piso 9, CP 1092 Buenos Aires, Phone: (011) 54 134-5583, Telex: (390) 22644 (BAZAN AR)

**ASIA:** S.W. Chan, Asia Computerworld Communications Ltd., 701-4 Kam Chung Bldg., 54 Jaffe Road, Wanchai, Hong Kong, Phone: (011) 852 5 861 3238, Fax: (011) 852 5 861 0953.

**AUSTRALIA:** Alan Power, IOG Communications Pty. Ltd., 37-43 Alexander Street, Crows Nest, NSW 2065, Phone: (011) 61 2 4395133, Telex: (790) AA74752 (COMWOR), Fax: (011) 61 2 439 5512.

**AUSTRIA:** Manfred Weiss, CW Publikationen Verlags Ges.m.b.H., Zieglergasse 6, A-1070 Wien, Austria, Phone: (011) 43-523-16-31-0, Telex: (847) 115542 (SCH/A) FAX: (011) 43 523 05 08 33.

**BRAZIL:** Ney Kruel, Computerworld do Brazil Ltda, Praca Floriano, 19/26 Andar, 2031 Rio de Janeiro, RJ Brazil, Phone: (011) 55 21 240 8225, Telex: (391) 21 30830 BR, Sao Paulo: Computerworld do Brazil Ltda., Rua Joaquim Floriano, 488/3 andar-CEP 04534, Sao Paulo, Brazil, Tel: (011) 55 11 853 8149, Telex: (391) 1132017 (WORO BR).

**COLOMBIA:** Rodrigo Ruentes, La Nueva Lay, Transv. 428 No. 99 A/66, Apartado 58505, Bogota, O.E. Columbia, Tel: (011) 571 271 5165.

**DENMARK:** Preben Engell, IOG Danmark A/S, Krujmtappan 4 OK-2500 Valby Denmark, Tel: (011) 45 36 442800, Telex: (855) 31566, FAX: (011) 45 36 442033.

**FRANCE:** Francois Chaussonniere, IDG Communications S.A., Immeuble La Fayette, 2, Place des Vosges, Cedex 65, 92051 Paris la Defense, France, Tel: (011) 33 1 4904 7900, Telex: (842) 613234F, Fax: (011) 33 1 4904 7800.

**HUNGARY:** Derszo Futasz, Computerworld Informatika Co., Krt. Pt. 386, 1536 Budapest, Hungary, Phone: (011) 3611 228 458, Telex: (861) 225307 (KSHP H), Fax: (011) 3611 423 965.

**INDIA:** Michael Sales, Media Transasia India Ltd., 102 Anand Lok, New Delhi 110049, India, Tel: (011) 91 11 644 0110, FAX: (011) 91 11 643 2950.

**ITALY:** Umberto Costamagna, Computer Publishing Group CPG, Via Vida 7, 20127 Milano, Italy, Phone: (011) 39-2 2613432, Telex: (843) 335318, FAX: (011) 39 2 284 0737.

**JAPAN:** Jim Povec, IOG Communications/Japan, Kiocho TBR Bldg., 5-7 Kojimachi, Chiyodaku Tokyo 102, Japan, Tel: (011) 81 3 222 6411, Telex: (781) 252 4217, Fax: (011) 81 3 222 6566.

**MEXICO:** Henry Morales, Computerworld Mexico S.A. de C.V., Oaxaca 21-2, Mexico City 7 O.F. Colonia Roma, 06700 Mexico, Tel: (011) 52 5 514 4218 or 6309, Telex: (383) 177 1300 (ACHAME), Fax: (011) 525 511 4860.

**THE NETHERLANDS:** Wout Berends, IDG Communications B.V., de Paulus Potterstraat 18, 1071 DA Amsterdam, The Netherlands, Tel: (011) 31 20 664 6426/664 5818, Telex: (844) 18242 (COWOM NL), Fax: (011) 3120 796 006.

**NEW ZEALAND:** Martin Taylor, IOG Communications Ltd., 2nd Floor, 15 Augustus Terrace, Parnell, Auckland 1, New Zealand, Phone: (011) 64-9-779-902, Fax: (011) 64 9 774 604.

**NORWAY:** Morten Hansen, CW Norge A/S, Hovinveien 43, 0576, Oslo 5, Norway, Phone: (011) 472 647725, Telex: (856) 76476 (CW NOR N), FAX: (011) 47 268 0152.

**PEOPLE'S REPUBLIC OF CHINA:** Shen Yao, China Computerworld, 74 Lu Gu Road, Box 750, Beijing 100039, People's Republic of China, Tel: (011) 861 81 0044, Telex: (716) 222214 (CCW CN).

**SINGAPORE:** Asia Computerworld Communications, 04-07 Parkway Builders Centra, No.1 Marine Parade Central, Singapore 1544, Republic of China, Phone: (011) 65 345 8383, Telex: (786) RS 37003 (Comwor), FAX: (011) 65 345 7097.

**SOUTH KOREA:** Young S. Gimm, Hi Tech Information, Inc. 3rd floor, Youngjae Building, 1600-7 Seocho 3 Dong, Seocho-gu, Seoul 137-073 Korea, Tel: (011) 82 2 588 8922, FAX: (011) 82 2 582 9823.

**SPAIN:** Paco Zabala, CW Communications, S.A., Rafael Calvo, 18, 48, 28010 Madrid, Spain, Phone: (011) 34 1 419 4014, Telex: (831) 45522 (CW E), Fax: (011) 34 1 419 6104.

**SWEDEN:** Bengt Samfeldt, CW Communications AB, Sodra Hamnvagen 22, S-115 41 Stockholm, Sweden, Tel: (011) 46 8667 9180, Telex: (854) 14904 9 (NOVACW), FAX: (011) 46 8665 3132.

**SWITZERLAND:** Gebhard Osterwalder, CW Publikationen AG, Witikonstrasse no. 15, Postfach 253, CH - 8030 Zurich, Switzerland, Phone: (011) 41 1 55 10 77, Telex: (845) 816 710 (CWCI CH), FAX: (011) 41 1 55 1135.

**TAIWAN:** David Chu, IOG Communications/Taiwan, 4F-2, No. 137, Fu Hsin South Road, Sec. 1 Taipei, Taiwan, Phone: (011) 886 2 776 4553, Telex: (785) 14142 (ACE-GROUP), FAX: (011) 886 2 721 6444.

**LONDON:** Martin Durham, CW Communications Ltd., 99 Grays Inn Rd., London, WC1 8UT, United Kingdom, Phone: (011) 44 1 831 9252, Telex: (851) 262346, FAX: (011) 44 1 405 2347.

**UNITED KINGDOM:** Colin Smith, Oliver Smith & Partners, 18 Abbeville Mews, 88 Clapham Park Road, London SW4 7BX, United Kingdom, Phone: (011) 44-1-978-1440, FAX: (011) 44-1-978-1550.

**VENEZUELA:** Kalman von Vajna Nagy, IOG Comunicaciones C.A., Torre Maracabo, Piso 10, Oficina H, Av. Libertador, Caracas, Venezuela, Phone: (011) 58 2 72 78 30, FAX: (011) 58 2 724970.

**WEST GERMANY:** Eckhard Utpadel, IOG Communications Verlag AG, Rheinstrasse 26/86, Postfach 40 04 29, 8000 Munich 40, West Germany, Phone: (011) 49 89 360860, Telex: (851) 5215350, (COMW D), FAX: (011) 49 89 3 60 86257.

## INTERNATIONAL DATA GROUP, INC.

Patrick J. McGovern  
Board Chairman

Axel Lablols  
Vice Chairman

Walter Boyd  
President

William P. Murphy  
Vice President/Finance

Computerworld is a publication of International Data Group, the world's largest publisher of computer-related information. International Data Group publishes over 130 computer publications in more than 40 countries. Nineteen million people read one or more International Data Group publications each month. International Data Group's publications include: ARGENTINA'S Computerworld Argentina; ASIA'S Asian Computerworld; AUSTRALIA'S Computerworld Australia; PC World, Macworld; AUSTRIA'S Computerwelt Österreich; BRAZIL'S DataNews, PC Mundo; CANADA'S ComputerData; CHILE'S Informatica; Computacion Personal; COLOMBIA'S Computerworld Colombia; DENMARK'S CAD/CAM WORLD, Computerworld Denmark, PC World, Macworld, Unix World; FINLAND'S Mikro PC, Tietovikko; FRANCE'S Le Monde Informatique, Distributeurs, InfoPC, Telecoms International; HUNGARY'S Computerworld SZT, Mikrovilag; INDIA'S Computers & Communications; ISRAEL'S People & Computers; ITALY'S Computerworld Italia, PC World Italia; JAPAN'S Computerworld Japan, Infoworld, Publish; KOREA'S Hi-Tech Information/Computerworld; MEXICO'S Computerworld Mexico, PC Journal; THE NETHERLANDS' Computerworld Netherlands, PC World, Amiga World; NEW ZEALAND'S Computerworld New Zealand, PC World New Zealand; NIGERIA'S PC World Africa; NORWAY'S Computerworld Norge, PC World Norge CAD/CAM, Macworld Norge; PEOPLE'S REPUBLIC OF CHINA China Computerworld, China Computerworld Monthly; POLAND'S Computers; SPAIN'S CIM World, Comunicaciones World, Computerworld Espana, PC World, Amiga World; SWEDEN'S Computer Sweden, PC/Nyheterna, Mikrodator, PC World, Macworld; SWITZERLAND'S Computerworld Schweiz; TAIWAN'S Computerworld Taiwan, PC World; UNITED KINGDOM'S Graduate Computerworld, PC Business World, ICL Today, Lotus UK, Macworld U.K.; UNITED STATES' Amiga World, CIO, Computerworld, Digital News, Federal Computer Week, GamePro, InCider, InfoWorld, International Customer Publishing, Macworld, Network World, PC Games, PC World, Portable Computing, PC Resource, Publish, Run, Sun Tech Journal; U.S.S.R.'S PC World U.S.S.R., Manager, PC Express, Network; VENEZUELA'S Computerworld Venezuela, Micro Computerworld; WEST GERMANY'S Computerwoche, Information Management, PC Woche, PC Welt, Amiga Welt, Macwelt.

ABP.....85  
Ashton-Tate.....72-73  
AT&T..... 16-17,50,61,78,90-91

Blyth Software.....10  
Businessland.....44-45

Cabletron Systems.....59  
Chipcom.....92  
Cincom Systems.....14,56  
Circie Training.....32  
Codex.....62  
Command Technology Corp.....47  
Computer Associates.....5,48-49  
CW Circulation.....88  
CW Editorial Reprints.....87

Data General.....64-65  
DataSouth.....52-53

Eastman Kodak.....46  
Epson.....26-27

GTE Telops.....69

Hewlett Packard.....19-21

IBM.....33  
Information Builders.....24,77  
Intel/Jupiter Tech.....58  
Interface Group.....81

Knowledgeware.....68

Leading Edge.....36-37

Micro Focus.....35  
Microcom.....38  
Microgate.....30  
Multi-Tech Systems.....12

Napersoft.....25  
NETEC International.....32  
Network Systems.....71  
Networld.....86

Oracle.....7,9,11

Paragon Software.....34  
Platinum Technology.....42-43

Ross Systems.....83

SAS Institute.....15,84  
Software AG.....13  
Sterling Software,  
Dylakor Division.....116  
Syncsort.....3

3Com.....54-55  
Texas instruments.....82  
Timeplex.....74

Universal Data Systems.....80

Walker Interactive.....28  
Wang.....115  
Wyse Technology.....40-41

XDB Systems.....39  
Xerox.....31

This index is provided as an additional service. The publisher does not assume any liability for errors or omissions.

## Have A Problem With Your Subscription?

We want to solve it to your complete satisfaction, and we want to do it fast. Please write to:

**COMPUTERWORLD, P.O. Box 2043,  
Marion, Ohio 43305-2043.**

Your magazine subscription label is a valuable source of information for you and us. You can help us by attaching your magazine label here, or copy your name, address, and coded line as it appears on your label. Send this along with your correspondence.

## Address Changes or Other Changes to Your Subscription

All address changes, title changes, etc. should be accompanied by your address label, if possible, or by a copy of the information which appears on the label, including the coded line. Please allow six weeks for processing time.

## Your New Address Goes Here

Name \_\_\_\_\_  
Company \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Address shown: ☐ Home ☐ Business

## Other Questions and Problems

It is better to write us concerning your problem and include the magazine label. Also, address changes are handled more efficiently by mail. However, should you need to reach us quickly the following toll-free number is available:

**1-800-669-1002**

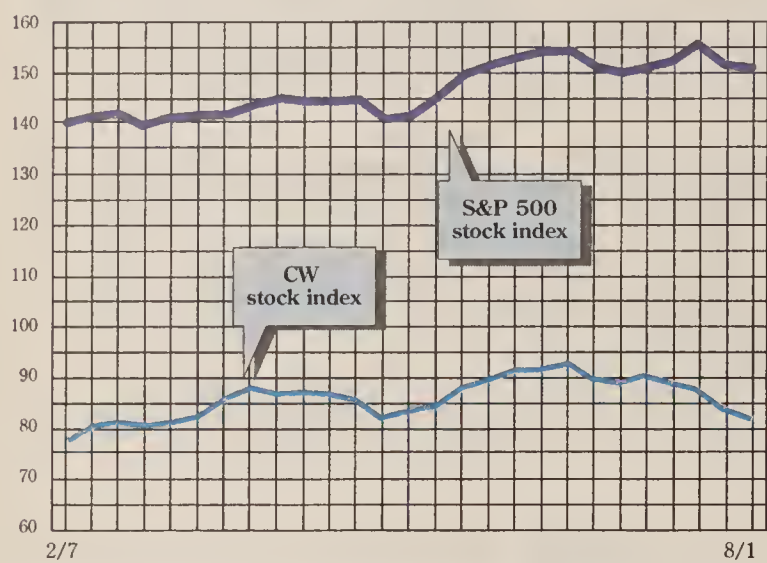
Outside U.S. call: (614) 382-3322



**COMPUTERWORLD**

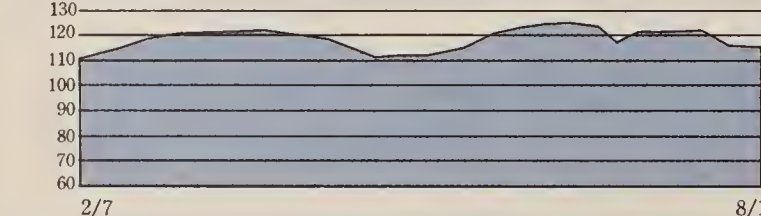
P.O. Box 2043, Marion, Ohio 43305

# STOCK TRADING INDEX

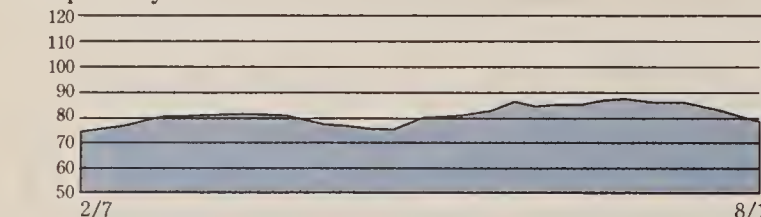


Indexes	Last Week	This Week
Communications	117.2	116.7
Computer Systems	83.1	79.3
Software & DP Services	120.6	117.7
Semiconductors	54.0	53.3
Peripherals & Subsystems	92.3	89.9
Leasing Companies	75.7	71.8
Composite Index	84.6	82.3
S&P 500 Index	150.9	150.2

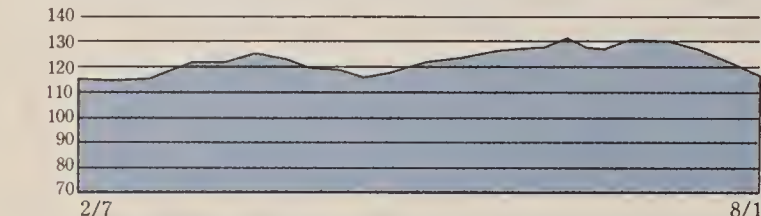
## Communications



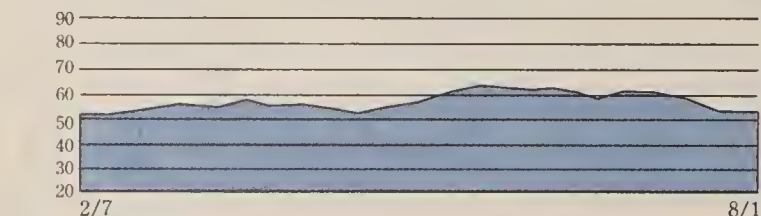
## Computer Systems



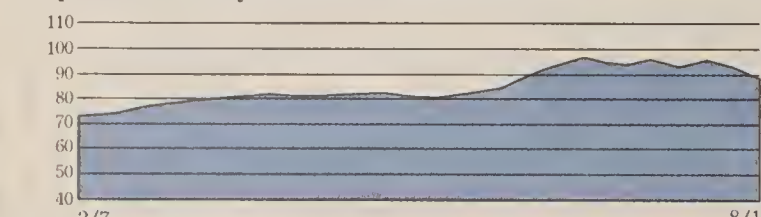
## Software & DP Services



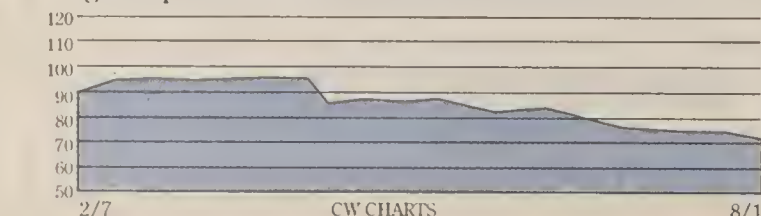
## Semiconductors



## Peripherals & Subsystems



## Leasing Companies



# Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, AUGUST 1, 1990

EXCH		52-WEEK RANGE	PRICE CLOSE AUGUST 1, 1990	WEEK NET CHNGE	WEEK PCT CHNGE
Communications and Network Services					
N	AMERICAN INFO TECHS CORP	68 55	61.625	3.3	5.6
Q	ANDREW CORP	26 19	19.25	-2.3	-10.5
Q	ARTEL COMM CORP	10 4	4	-0.3	-5.9
N	AT&T	47 36	36.75	-0.6	-1.7
Q	AVANTEK INC	7 2	2.875	-0.1	-4.2
N	AYDIN CORP	21 13	13.25	-0.3	-1.9
N	BELL ATLANTIC CORP	57 43	49.875	2.5	5.3
N	BELLSOUTH CORP	59 49	55	2.9	5.5
Q	COMPRESSION LABS INC	16 7	14.5	-0.4	-2.5
Q	CONTEL CORP	37 23	33.625	0.9	2.7
Q	OATA SWITCH CORP	4 2	3.75	0.3	7.1
Q	OIGITAL COMM ASSOC	27 17	22.5	-0.8	-3.2
Q	OYNATECH CORP	21 15	18.125	0.0	0.0
Q	FIBRONICS INTNL INC	13 5	10.75	-0.4	-3.4
Q	GANOALF TECHNOLOGIES	7 2	3	-0.3	-9.4
N	GENERAL OATACOMM INOS	7 3	3.625	0.0	0.0
N	GTE CORP	36 28	29.25	1.1	4.0
Q	INFOTRON SYS CORP	11 3	3.25	0.1	4.0
N	ITT CORP	65 51	58	0.0	0.0
N	M A COM INC	8 3	5.125	0.5	10.8
Q	MCI COMMUNICATIONS CORP	49 31	37	-1.0	-2.6
Q	NETWORK EQUIP TECH INC	34 7	7	-0.8	-9.7
Q	NETWORK SYS CORP	15 7	10.875	-1.0	-8.4
Q	NORTHERN TELECOM LTO	30 20	27	0.8	2.9
Q	NOVELL INC	59 24	49	-0.3	-0.5
Q	NYNEX CORP	92 74	76.625	1.6	2.2
A	PACIFIC TELESIS GROUP	52 40	42.875	1.4	3.3
N	PENRIL CORP	9 4	7.625	-0.3	-3.2
N	SCIENTIFIC ATLANTA INC	29 19	25.625	-2.1	-7.7
N	SOUTHWESTERN BELL CORP	65 51	54.75	2.6	5.0
Q	3 COM CORP	19 10	15.875	-0.5	-3.1
N	US WEST INC	41 33	37.5	2.0	5.6

## Computer Systems

N	ALLIANT COMPUTER SYS	9 4	4.25	-0.1	-2.9
N	ALPHA MICROSYSTEMS	8 2	2.407	-0.2	-8.3
N	ALTOS COMPUTER SYS	8 5	8.25	0.0	0.0
A	AMOHL CORP	19 11	15.25	-1.5	-9.0
N	APPLE COMPUTER INC	50 32	42.375	0.1	0.3
N	AST RESH INC	26 7	21.125	-1.5	-6.6
N	BOLT BERANEK & NEWMAN	9 4	4.25	-0.4	-8.1
N	COMPAQ COMPUTER CORP	68 37	54.75	-4.6	-7.8
N	COMMODORE INTNL	12 6	6.875	-0.1	-1.8
N	CONTROL DATA CORP	22 16	15.625	-1.3	-7.4
N	CRAY RESH INC	51 31	43.5	-1.5	-3.3
N	OATA GEN CORP	17 7	7.5	-1.4	-15.5
N	OATAPOINT CORP	6 2	1.625	-0.5	-23.5
N	OELL COMPUTER CORP	14 5	12	0.3	2.1
N	OIGITAL EQUIP CORP	103 70	74.375	-0.5	-0.7
N	FLOATING POINT SYS INC	4 0	2.375	-0.1	-5.0
N	HARRIS CORP	40 28	30.375	-2.4	-7.3
N	HEWLETT PACKARD CO	58 40	42.375	-2.8	-6.1
N	HONEYWELL INC	112 73	101.75	-2.3	-2.2
N	IBM	123 93	111.625	-3.1	-2.7
N	INFORMATION INTL INC	16 12	12.625	-0.4	-2.9
N	IPL SYS INC	14 5	11.5	1.3	12.2
N	MAI BASIC FOUR INC	6 2	2	0.0	0.0
N	MATSUSHITA ELEC INOL LTO	180 123	136.5	-3.5	-2.5
N	MENTOR GRAPHICS CORP	26 14	15.75	-1.0	-6.0
N	NBI INC	2 0	0.281	0.0	-10.2
N	NCR CORP	72 55	69.25	0.3	0.4
N	PYRAMIO TECHNOLOGY	36 12	23	-2.0	-8.0
N	SEQUENT COMP SYS INC	34 13	26.5	-2.5	-8.6
N	SUN MICROSYSTEM INC	37 13	31.5	-2.0	-6.0
N	SYMBOLICS INC	2 0	0.375	-0.1	-14.4
N	TANOEM COMPUTERS INC	30 18	18.875	-0.4	-1.9
N	TANQY CORP	49 30	37.375	1.0	2.7
N	ULTIMATE CORP	11 5	6	-1.1	-15.8
N	UNISYS CORP	23 11	11.125	-0.8	-6.3
A	WANGLABS INC	7 4	4	-0.1	-3.0

## Software & DP Services

N	AMERICAN MGMT SYS INC	20 11	17.5	0.3	1.4
N	AMERICAN SOFTWARE INC	18 10	14.125	-1.0	-6.6
N	ANACOMP INC	7 2	3	0.5	20.0
N	ANALYSTS INTL CORP	24 14	19.5	-0.5	-2.5
N	ASHTON TATE	15 8	10.375	-0.1	-1.2
N	ASK COMPUTER SYS INC	14 7	9.625	-0.4	-3.8
N	AUTO DATA PROCESSING	60 40	52.75	-2.3	-4.1
N	AUTOODESK INC	60 33	53.25	-0.1	-0.2
N	BMC SOFTWARE INC	30 14	25.5	-0.5	-1.9
N	BUSINESSLAND INC	14 7	6.875	-0.4	-5.2
N	COGNOS INC	10 4	9.625	-0.1	-1.3
N	COMPUTER ASSOC INTL INC	20 8	8.375	-1.1	-11.8
N	COMPUTER HORIZONS CORP	17 7	16	-0.3	-1.5
N	COMPUTER SCIENCES CORP	59 40	43.125	-0.4	-0.9
N	COMPUTER TASK GROUP INC	14 9	10.5	0.0	0.0
N	COMSHARE INC	25 15	21	-0.8	-3.4
N	CORPORATE SOFTWARE	16 8	14.5	0.4	2.7
N	GENERAL MTRS (CLSE)	38 24	33.25	-0.5	-1.5
N	GOAL SYSTEMS INTL	18 10	14.875	-0.1	-0.8
N	HOGAN SYS INC	7 3	3.25	-0.1	-3.7
N	INFORMIX CORP	18 8	10.375	-0.8	-6.7
N	INTELLICORP INC	8 4	4.875	-0.3	-4.9
N	LEGENT CORP	32 19	23.5	-1.3	-5.1
N	LOTUS DEV CORP	39 21	23	0.0	0.0
N	MICROSOFT CORP	81 27	66.75	-4.8	-6.6
N	NATIONAL OATA CORP	35 11	12.875	-1.1	-8.0
N	ON LINE SOFTWARE INTL INC	11 6	7	-0.5	-6.7
N	ORACLE SYS CORP	188 15	17.125	-0.5	-2.8
N	PANSOPHIC SYS INC	19 10	12.625	-0.3	-1.9
N	PHOENIX TECHNOLOGIES INC	6 2	3.25	-0.3	-7.1
N	POLICY MGMT SYS CORP	43 30	43.375	0.0	0.0
N	PROGRAMMING & SYS INC	25 16	18.25	-0.8	-3.9
N	RELATIONAL TECH INC	10 5	4.875	-0.6	-11.4
N	REYNOLDS & REYNOLDS CO	27 19	19.625	-0.6	-3.1
N	SAGE SOFTWARE INC	16 7	13	-1.5	-10.3
N	SEI CORP	22 15	20.25	-1.8	-8.0
N	SHAREO MEO SYS CORP	17 12	14.375	1.5	11.7
N	SOFTWARE PUBG CORP	28 14	26.25	-0.5	-1.9
N	STERLING SOFTWARE INC	11 7	9.5	0.3	2.7
N	SUNGARD OATA SYS INC	26 17	22.5	-1.3	-5.3
N	SYSTEM CENTER INC	25 16	15.625	-1.4	-8.1
N	SYS. SOFT INC	29 16	23.25	-1.8	-7.0
N	WORDSTAR	2 1	0.969	-0.1	-8.8

## Semiconductors

N	ADV MICRO DEVICES INC	11 7	6.875	-0.4	-5.2
N	ANALOG DEVICES INC	11 7	6.875	0.0	0.0
N	ANALOGIC CORP	11 8	9.375	0.1	1.4
N	CHIPS & TECHNOLOGIES INC	26 15	16.25	0.0	0.0
N	INTEL CORP	52 28	42.5	-1.0	-2.3
N	MICRON TECHNOLOGY INC	17 7	11.125	-0.5	-4.3
N	MOTOROLA INC	88 53	80.375	0.6	0.8
N	NATL SEMICONDUCTOR	9 5	5.625	0.1	2.3
N	TEXAS INSTRS INC	44 28	31.625	-1.6	-4.9
A	WESTERN DIGITAL CORP	15 6	12.125	-0.1	-1.0

## Peripherals

N	ALLOY COMP	2 0	0.625	0.0	-0.2
N	AM INTL INC	6 2	2	-0.3	-11.1
N	AUTO TROL TECH CORP	5 2	3.25	0.2	6.1
N	BANCTEC INC	24 13	19.25	-1.0	-4.9
A	COGNITRONICS CORP	8 3	6.25	-0.3	-3.8
N	CONNER PERIPHERALS	31 11	27.125	-0.8	-2.7
N	OATARAM CORP	22 8	19	0.3	1.3
N	EASTMAN KODAK CO	52 36	42.375	3.9	10.1
N	E M C CORP MASS	7 3	5.625	0.0	0.0
N	EMULEX CORP	9 4	7.125	0.1	1.8
N	EVANS & SUTHERLAND	35 18	26.25	-3.0	-10.3
N	ICOT CORP	2 1	1.563	0.1	4.2
N	INTERLEAF INC	8 5	6.375	0.3	4.1
N	IOMEGA CORP	6 3	5	-0.3	-4.8
N	MASSTOR SYS CORP	4 1	1.188	0.0	0.0
N	MAXTOR CORP	17 7	10.75	0.5	4.9
N	MICROPOLIS CORP	10 3	8.375	-0.1	-1.5
N	MINNESOTA MNG & MFG CO	91 68	91	0.1	0.1
N	PERSONAL COMP PRODUCTS INC	5 4	3.969	-0.3	-6.6
N	PRINTRONIX INC	15 8	11.375	0.0	0.0
N	QMS INC	21 9	17.5	-0.8	-4.1
N	QUANTUM CORP	26 9	21.75	-0.6	-2.8
N	RECOGNITION EQUIP INC	10 4	5.25	0.1	2.4
N	REXON INC	10 6	6.75	-0.6	-8.5
N	SEAGATE TECHNOLOGY	20 11	12.625	0.1	1.0
N	STORAGE TECH CORP	35 9	25.875	-1.3	-4.6
N	TANON CORP	4 1	2.563	-0.3	-8.9
N	TEKTRONIX INC	23 12	16	-0.3	-1.5
N	TELEVIDEO SYS INC	1 0	0.344	-0.1	-15.3
N	XEROX CORP	69 44	47	1.4	3.0

## Leasing Companies

N	CAPITAL ASSOC INTNL INC	7 2	2.125	-0.3	-10.5
N	COMDISC INC	34 17	19.375	1.0	5.4
N	LOI CORPORATION	18 13	14.5	-0.8	-4.9
N	PHOENIX AMERN INC	5 3	3.625	0.0	0.0
N	SELECTERM INC	9 4	4.5	-0.8	-14.3

EXCH: N = NEW YORK; A = AMERICAN; Q = NATIONAL

## Guns of August

### Revenue bombshells continue to take their toll on tech firms

Shrapnel from earnings report artillery continued to rain on Wall Street last week, although most of the heavy shelling is over until next quarter. Even the major players were blasted. IBM, for example, lost 1½ points to close Thursday at 109¾.

NEC Technologies, Inc. was hit hard, giving up 3¾ points to end at 58¾. Rival mainframe makers also stumbled, including AMDahl Corp., which closed at 14¼, down 1 point for the week, and Unisys Corp., which slipped to a new low mark of 10½, down ⅝ of a point.

Sellers bombarded the hardware sector as well. Compaq Computer Corp. was driven down 2½ points to 53½, and Sun Microsystems, Inc. lost 1¼ points to 30½. Apple Computer, Inc. fought back, however, and gained 2½ points to close at 43½.

Gun-shy investors also invaded the software arena. Both Microsoft Corp. and Novell, Inc. declined. Microsoft dipped 3 points to 66, and Novell lapsed 2¼ points to 46¼, its third consecutive weekly decrease. Computer Associates International, Inc., still struggling to recover from its recent earnings-related dive, fell to a new low of 8¼, down ⅛ of a point.

Despite Ashton-Tate Corp.'s release of a revamped version of its flagship product, Dbase IV, the company's stock fell 1 point to 9¼. Lotus Development Corp. was among the few gainers for the week, picking up ½ a point to 22½, its first step forward after five weeks of stock price tumbles.

Both Hewlett-Packard Co. and Texas Instruments, Inc. backpedaled 1⅞ points, to 42¼ and 30⅞, respectively.

KIMS. NASH

# OSF eyes open net management

*Seeks to fill need for consistent net, systems management infrastructure*

BY JOANIE M. WEXLER  
CW STAFF

CAMBRIDGE, Mass. — The Open Software Foundation (OSF) set a lofty network management goal last week that could produce a godsend for customer sites sometime in 1991.

The OSF, which aims to deliver standards-based, interoperable software, has issued a request for vendors to submit technologies for what it has dubbed its Distributed Management Environment (DME). DME would provide a consistent infrastructure for integrated network management and sys-

tems administration across multivendor platforms and operating systems.

The OSF's efforts address a key problem in today's computing environment: the lack of a centralized system for controlling all computing resources and networks.

"If the OSF can pull this off, I can almost guarantee it will sell," said John Amidon, manager of technical support and communications at the Arizona Department of Transportation. "I'm running three different networks supported by three different staffs, all trained in their respective niches. If my people

could work on all the networks simultaneously, that would be ideal."

Michael Prince, MIS director at the Burlington Coat Factory Warehouse Corp., said he could use such a product right now: "The two network vendors I use both purport to be developing similar software, but the idea of doing it as a cross-vendor product is even more appealing. The way it is now, we have to be more reactive than proactive with some of the workstation problems in our stores."

One analyst said that managing systems with one consistent approach is generally among us-

ers' top three current priorities. Michael Goulde of Open Systems Advisor, a Boston-based consultancy, said that companies committed to or seriously evaluating open systems would be likely beneficiaries of the OSF's efforts.

"There's a proportional increase in the intensity of a company's interest in DME and the size and complexity of its computing environment," Goulde said.

Jonathan Gossels, OSF's business area manager, added that for software vendors, the DME package will provide tools for simplified development of portable applications that no longer have to be designed for just one platform. This should foster a wealth of management applications for both stand-alone and distributed systems, according

to Gossel.

IBM and Digital Equipment Corp., both of which are OSF members and have invested heavily in proprietary network and applications management schemes, were instrumental in developing the specifications for the OSF request, Gossel said. He said that presumably each of those major vendors would submit its own proposal to the OSF.

The DME concept parallels that of the group's Distributed Computing Environment, an integrated set of technologies aimed at allowing transparent computing in heterogeneous environments. DME could be available sometime during 1991, but the target date is dependent on how many vendors submit proposals, which will affect the time needed for the evaluation process, Gossels said.

## Deficit

FROM PAGE 1

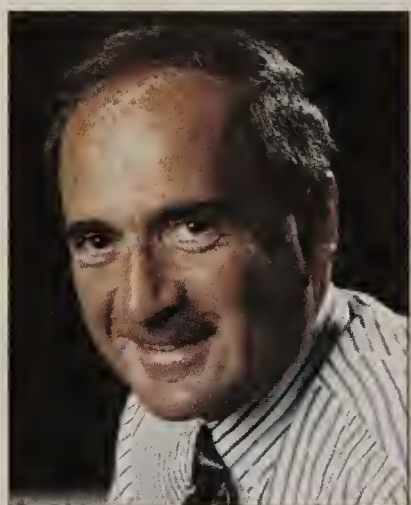
executives pointed out, has a particularly urgent stake in swift and sure deficit reduction. The soaring deficit, said Sun Microsystems, Inc. Chief Executive Officer Scott McNealy, "makes the cost of capital very high. It costs me three times more for capital than it costs in Japan. And that makes it very difficult to compete against the Japanese."

The deficit inhibits our ability to compete overseas in more ways than just spiking the cost of capital, Ehrlich added: "It also puts upward pressure on interest rates, and raises uncertainty about the future." As a final irony, he said, creditor nations "are so busy buying our bonds, they have no money to buy our goods."

As surely as it is sabotaging U.S. industry's international competitive position, the deficit is sinking morale at home, industry leaders generally agreed.

"The budget deficit hangs like a dark cloud over the economy," AT&T Chief Financial Officer Morris Tannenbaum said. "It's a sign of our inability to run the country."

Not all technology firm executives see deficit reduction as a burning issue for the technology business community. Computer Associates International, Inc. President Anthony Wang, for in-



**M**AYBE THE Gramm-Rudman cuts have to be implemented."

GEORGE SCALISE  
MAXTOR CORP.

stance, acknowledged the deficit's negative impact on the business climate in general but noted that "historically . . . the software industry has been relatively immune to down cycles in the economy."

For most, however, the sense of urgency is mounting. "President Bush has put taxes on the table, and Congress has put entitlements on the table," said Hewlett-Packard Co.'s CEO John A. Young in a joint statement released by the heads of 11 major computer vendors earlier

this summer. "Now that these two stumbling blocks are behind us, the president, his administration and the bipartisan leadership of both houses of Congress should seize this opportunity and draft a meaningful deficit reduction plan."

The self-proclaimed "unprecedented joint statement" was issued by Young and industry leaders including, among others, IBM's John Akers, Digital Equipment Corp.'s Kenneth Olsen, Compaq Computer Corp.'s Rod Canion and Apple Computer, Inc.'s John Sculley. The executives applauded what appeared to be a giant step toward real action on the budget and threw their support behind President Bush's emphasis on capital gains and education.

Unfortunately, however, the computer industry leadership suffers from the same problem that plagues the congressional leadership: There is a lot more consensus on where to go than on how to get there.

Richard Carpenter, CEO at computer-aided software engineering products vendor Index Group, Inc. in Cambridge, Mass., advocated enforcement of the \$100 billion worth of automatic spending cuts mandated by the Gramm-Rudman Act as enacted. "I was optimistic [about Gramm-Rudman] at the outset," Carpenter said, "but there are just too many loopholes as it exists now."

Maxtor Corp. CEO George Scalise also looked to Gramm-Rudman, albeit reluctantly. The U.S. has spent too much time and effort trying to disguise the actual size of the deficit, he said, citing as an example the fact that the current "S&L debacle is not being considered a part of it." What we can't face, we can't fix, Scalise said. "Maybe the Gramm-Rudman cuts have to be implemented," he concluded. "Maybe that's what it will take."

"I've got mixed emotions on that issue," said Robert Paluck,

CEO at minisupercomputer market leader Convex Computer Corp. "I think the government needs to do *something*, but I also know that government spending, and defense spending in particular, affects the overall economy dramatically." Gramm-Rudman in full gear, Paluck said, could trigger a recession.

Further mixing the emotions of computer industry executives, Ehrlich noted, is the prospect that "[research and development] credits will probably be among the oxen gored" in a spending cuts program.

Consequently, many are focusing on taxation as the preferable path. "You fix the deficit by raising revenues," Ehrlich said. "This has been the sole and obvious solution since the deficit first appeared 10 years ago, but we've refused to do it for purely ideological reasons."

Two alternatives that garner widespread computer industry

support are government actions geared toward enhancing U.S. competition in the global market — relaxing current export restrictions and antitrust law modifications, for example — and measures aimed at retrieving the massive amounts of money reputed to be slipping through assorted federal government cracks.

At the end of the day, McNealy said, "there are no simple solutions. But voters have to get upset, learn more about the issue and make their choices." In a complex situation with no perfect answers — and, without a doubt, no free rides — most of the executives agreed that the only action that would be completely incorrect is no action at all.

Senior Correspondent Johanna Ambrosio, Staff Writer Sally Cusack and Correspondent Michael Fitzgerald contributed to this report.



**T**HE PRESIDENT and the bipartisan leadership of Congress should seize this opportunity and draft a meaningful deficit reduction plan."

JOHN A. YOUNG  
HEWLETT-PACKARD

## To get from here to there

**I**n a recent survey, a majority of the 259 members of the National Association of Business Economists said the probability of a major deficit-reduction deal is improving. However, they remained skeptical about how that improvement might be brought about:

- More than 80% of the panel members saw deficit reduction as "important" or "very important." However, only 7% thought that a major (\$30 billion to \$40 billion or more per year), multiyear deficit reduction package was the best bet. Smaller changes or a one-year deal are more likely, they said.
- Defense cuts and so-called "sin taxes" are likely to lead the way in any deficit package, the survey said. More than 90% of the panel members said that taxes on alcohol and tobacco are likely to be raised if there is a major budget agreement, while 91% believed that defense cuts will be included in a deal. A majority thought gasoline taxes will also be raised. Only 8% saw no major spending cuts ahead; 2% predicted that there will be no tax change.
- The panel sees positive change from a major budget agreement: In three or more years, inflation and interest rates will fall while real GNP will grow, members said. In the short run, however, a majority (61%) said that real growth will be lower even though interest rates and inflation will also be reduced.

SOURCE: NATIONAL ASSOCIATION OF BUSINESS ECONOMISTS, CLEVELAND, OHIO

## NEWS SHORTS

### Mideast fears swamp stock trades

Fear that Iraqi leader Saddam Hussein's thirst for conquest will trigger a U.S. and possibly a worldwide recession prompted heavy trading Friday on the New York Stock Exchange and kicked off "circuit breakers" that temporarily halted trading at two Chicago exchanges.

The Dow Jones Industrial Average dropped precipitously 122 points by 2 p.m. before recovering to down just 55 from the previous day, with more than 293 million shares trading hands.

Computerized circuit breakers kicked in early Friday at both the Chicago Mercantile Exchange and the Chicago Board of Trade, halting trading for short periods. At the Merc, an automatic 10-minute halt in trading was called at 8:37 a.m. Central Standard Time, when the Standard & Poor's 500 index fell by five points in early trading. A second circuit breaker kicked in when the S&P 500 fell 12 points below its opening level; trades below this level were halted for 30 minutes. At the CBOT, futures trading was halted for 30 minutes at 8:50 a.m. Central Standard Time, after an index fell 20 points.

Technology stocks dropped precipitously, keeping pace with the market in general, analysts said. Ironically, when panic invades the market, the most profitable stocks get hit the hardest, noted David Wu, an analyst at S.G. Warburg & Co. "There are profits to be taken, and investors want those profits while they can still get them," Wu said. Last week was no exception, he said. Motorola, for example, dropped 10 points but recovered 8½ points by the close.

NELL MARGOLIS and MICHAEL FITZGERALD

### DEC whacks VAXft prices

Digital Equipment Corp. dropped the price of its fault-tolerant VAXft 3000 last week and tacked a scaled-down server onto its "never-fail" VAX line in what industry analysts said was an admission of overpricing on DEC's first foray into the fault-tolerant market. The VAXft 3000 model was sliced from \$229,000 to \$168,000 just weeks after it was first shipped in June. The newly configured server machine will sell for \$132,000.

### Closeout sale on PS/2s

IBM last week discontinued several Personal System/2 boxes and announced closeout price cuts of up to 34%. The PS/2 Model 60 041 has been reduced from \$4,195 to \$2,750. The Model 60 071 was cut from \$4,645 to \$3,085. The PS/2 Model 80 041 will sell for \$4,000, down from \$5,395. The Model 80 071 has been reduced from \$6,095 to \$4,500. IBM effectively displaced these machines when it introduced the Model 65SX and Model 80 back in March. The lower prices are in effect through Oct. 31, while supplies last.

### AD/Cycle gets midrange backing

Systems Software Associates, Inc. added its name last week to the roster of dozens of software companies supporting IBM's AD/Cycle strategy. However, it is one of the few midrange suppliers to do so. SSA, which sells applications to the IBM Application System/400 market, launched a set of computer-aided software engineering (CASE) products in January and now claims to have approximately 200 CASE customers. SSA plans eventually to provide tools compliant with AD/Cycle and move its users to the AD/Cycle repository in the future.

### AT&T on track with Amtrak

AT&T Computer Systems said last week that it has won a \$14 million contract to assist Amtrak in improving its reservation and ticketing systems. AT&T's role will reportedly be to install and maintain over 2,100 networked computers, custom software and peripherals in more than 300 Amtrak stations, reservation centers, ticket offices and administrative offices around the country. The contract relates to Amtrak's Terminal Replacement Project, which includes installation of AT&T's 6286/EL Work Group System entry-level workstation introduced earlier this year. Installation is reportedly scheduled to begin late next month and take 18 months.

## SIM toots innovative horns

*Honors city of Dallas, pharmaceutical distributor for technological savvy*

BY CLINTON WILDER  
CW STAFF

Every user wants a system that responds quickly with accurate information. But if you are a police officer or a crime victim, those technology attributes can mean a lot more than improved profits or productivity.

The Dallas Police Department has proved this during the past two years, and last week the city of Dallas was named one of two winners of the fourth annual Society for Information Management (SIM) Partners in Leadership Awards.

The second winner was a more traditional business user and renowned technology leader, Orange, Calif.-based wholesaler Bergen Brunswig Corp. The \$4 billion distributor of pharmaceutical and electronic products was cited for nearly 20 years of information systems innovations resulting from the close relationship between its IS and business leadership.

The Dallas Police Department's cruiser-based mobile data terminals have direct links to the city's 911 phone system, which transfers an emergency

caller's phone number and address directly to the screen in the cruiser. Patrolmen know the caller's location and can respond when the caller cannot speak English to the dispatcher, is lost or confused or cannot speak at all.

On-line data access means that when a cruiser stops a car on the highway, the patrolman can key in the license number and access the criminal records database, which responds within five seconds if the license plate registrant is already wanted in the Dallas area. That helps the officer decide

whether the driver is likely to be armed or dangerous; there have been several past incidences of Dallas policemen killed or wounded by gunmen in cars they had pulled over, said David J. Morgan, the city's director of information services.

In addition to law enforcement benefits, Morgan said, the terminals save money by transferring much of the person-to-person communications on the city's overburdened

radio dispatch system to on-line transactions. The \$3.5 million investment in terminals saved the city from having to replace the \$20 million radio system.

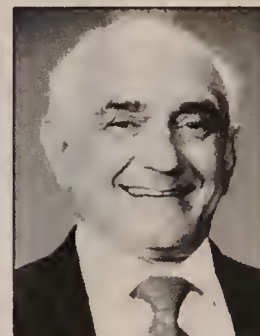
Morgan will share the SIM award with Leslie R. Sweet, assistant chief of police. Morgan attributed the technology success to "a chief who was not afraid to delegate" and cooperation between the IS staff and the users — the police officers.

At Bergen Brunswig, the SIM award was a fitting capstone to the career of Senior Vice-President Anthony A. Vallario, who will retire next year after 40 years in IS-related positions at the company. Vallario and business partner Emil P. Martini Jr., the company's chairman, pioneered the Pharmacy Automated System Entry on-line order entry system in 1973.

Since then, Bergen Brunswig has continually expanded the system's capabilities. One of the most recent innovations is a fully automated warehouse in Valencia, Calif., that allows an order to be sent by the customer, stocked, processed, routed and loaded onto a truck without any human intervention.



City of Dallas' David J. Morgan



Bergen Brunswig's Vallario

## The Clayton & Dubilier Selectric?

BY NELL MARGOLIS  
CW STAFF

ARMONK, N.Y. — IBM last week announced plans to spin off the division that originally electrified the American office.

With negotiations pending for a final deal with New York-based leveraged buyout firm Clayton & Dubilier, Inc., the IBM typewriter business, which made IBM a household name and saw "Selectric" become a common noun, will be held — along with certain printer and related supplies businesses — by a wholly owned IBM subsidiary, a company spokesman said.

In the near future, however, it is expected that the majority of shares in the new corporation — to be known in the interim as the IBM Information Products subsidiary — will be owned by Clayton & Dubilier. IBM plans to retain a minority stake.

The contemplated move would shift a quantum portion of the costs of developing, enhancing and marketing a set of non-strategic product lines away from IBM while allowing the company, through its minority interest, to share in the growth

anticipated for IBM Information Products.

IBM declined to place a dollar value on the deal. However, U.S. Marketing Director of Information Products Douglas R. LeGrande said the subsidiary will immediately join the ranks of the top 250 firms in the Fortune 1,000, with revenue in excess of \$2 billion.

With Clayton & Dubilier as controlling stakeholder, he said, the new subsidiary's product mix and the users who rely on it will be well positioned to get the attention they need.

Clayton & Dubilier is a privately held, 12-year-old investment firm whose stated strategy is to take over "divisions that a large company no longer considers to be part of its strategic business" and grow them through entrepreneurial techniques, such as employee stock ownership. IBM's prospective business partner has an established track record of boosting the profitability of its acquisitions by approximately 70% during its first five years as a majority owner.

"Our philosophy is really quite simple: to support manage-

ment, improve operations and build value that would benefit the new company's employees, customers, business partners, investors and the communities in which we operate," Clayton & Dubilier Chairman Martin Dubilier said in a prepared statement.

IBM provided some insurance of its own, in this case to users and employees who might otherwise see "leveraged buyout" as a euphemism for canceled product lines and plummeting service levels. For starters, the firm announced that current Vice-President Marvin Mann, who in the past headed IBM Information Products and is a trusted figure to many of its employees, will be the chief executive officer of the new subsidiary. In addition, IBM executives last week repeatedly stressed the extent to which Clayton & Dubilier reflects what IBM Chairman John Akers called "a set of values very similar to those of IBM."

The spin-off will cost some 1,200 Information Products employees their jobs, paring the total work force to approximately 3,500 by the end of 1990, IBM said.

## Europe

FROM PAGE 1

pressure on the company's mainframe margins, the most profitable part of its business. Downsizing and open systems, as well as more aggressive competition from Japan, Inc., will increasingly squeeze the profitability of its European operations.

"It's becoming harder for computer suppliers to get the gross margins that could cover their costs," said Angela Dean, an analyst at Morgan Stanley & Co. in London.

Growing Japanese aggressiveness was signaled last week when Fujitsu and STC PLC, ICL's parent firm, announced the signing of a \$1.37 billion deal giving Japan's biggest supplier an 80% stake in what has been, until now, the flagship of the UK's indigenous computer industry. The two companies have a long-standing technology-sharing agreement under which Fujitsu supplies key components for ICL-designed mainframes.

Although \$2.2 billion ICL is STC's crown jewel — providing 64% of corporate revenue and 68% of operating profit — the British government is not expected to oppose the acquisition. Pending shareholder approval, the deal is likely to be completed Nov. 30.

A number of observers speculated that other acquisitions will follow in Europe.

"I don't think this is the last case of a Japanese takeover," said Martin Hingley, an analyst at IDC Europe Ltd. in London.

Once they have greater control of their European distribution and marketing, the major Japanese players clearly intend to squeeze IBM in the mainframe market through a price war, analysts said.

With 52% of the European mainframe market, IBM could be in for a rough fight. In Japan, where IBM once dominated, it now stands in the No. 2 spot behind Fujitsu.

### Putting on the pressure

Fujitsu and Hitachi could turn the screws even tighter on IBM if they link their various European activities. Since Fujitsu also sells through Amdahl Corp. in Europe, observers speculated the company would eventually force ICL and Amdahl into cooperation. The British trade press reported last week that, once the deal takes effect, ICL would begin selling PCMs — normally Amdahl's turf — in addition to its own proprietary boxes.

Although ICL officials denied that they knew of any such plan, they refused to rule it out.

"It does seem to me that if you are controlling the technol-

ogy, you would want to leverage it as much as you can," said Gary Hegna, president of ICL, Inc., the company's North American affiliate. "But that's a decision that will be made in Tokyo."

IBM mainframe sales are also coming under pressure from a growing movement to downsize data processing operations and switch to open systems.

The open systems movement, born in Europe, has gained substantial momentum there in recent years. Fear of IBM hegemony across the continent, as well as governments' wishes to control their procurement costs, have incited users, both public and private, to demand products from their suppliers that conform to the Open Systems Inter-

connect (OSI) model.

"Competition is in performance and not in having differences that lock the customer into specific suppliers," said Frank Taylor, who until last year was chairman of the Confederation of European Computer User Associations.

"In Europe, a number of the very large blue chip organizations have made it clear that open systems is the direction they're going to take," said Harvey Parr, managing director of British systems integrator ACT Logsys Ltd.

He pointed to the UK Civil Aviation Authority, British Petroleum Co. PLC and the Department of Social Security as examples of organizations em-

playing OSI in campaigns to reduce their dependence on mainframes. The protocols serve to tie together department mini-computers and networks of personal computers to any remaining mainframes.

British Telecom PLC presents perhaps the most spectacular case of downsizing in the UK. The telecommunications carrier plans to reduce the number of mainframe-based data processing centers from 57 to less than 10 within the next 2½ years. The centers principally house IBM and Amdahl mainframes. To take up the processing slack, the number of PCs in the company is expected to rise from roughly 60,000 currently to about 95,000 in three years.

## Japanese line up as Europeans seek suitors

BY AMIEL KORNEL  
CW STAFF

Analysts say that any remaining illusions of a tripartite control of world computer markets — split between U.S., Japanese and European vendors — are dissipating.

A growing puddle of red ink on the financial statements of European suppliers is forcing some companies to question whether aspiring to independence is still realistic. The Europeans, who for a number of years have come to rely on Japanese technology, might bind their destinies even more tightly with their Japanese suppliers as competitive pressures grow.

As they seek partners or white knights, European computer companies are more likely to wed Japanese than American firms, analysts say.

"Americans are the obvious competition in Europe," said Angela Dean, a London-based analyst at Morgan Stanley & Co. "The Japanese can bring components, technology and cash to the partnership." U.S. firms have been either unwilling or unable to come up with this kind of dowry.

U.S. and Japanese suppliers have been jockeying for position in Europe, anticipating market

growth after the post-1992 opening of trade barriers among the 12 nations of the European Community.

Rather than sell products carrying their own brand name, Japanese firms have made technology agreements over the years with most major computer firms in Europe. Groupe Bull in France relies heavily on NEC Technologies, Inc. for its mainframes; West Germany's Siemens AG sells Fujitsu Microelectronics, Inc. computers; and West Germany's Comparex GmbH and Italy's Ing. C. Olivetti & Co. ship Hitachi Ltd. mainframes.

According to New York-based "Translink's European Deal Review," only five of 115 cross-order acquisitions made in the European electronics and computer sectors last year in-

involved Japanese companies. Prior to the Fujitsu-ICL deal, the most recent was last May, when Mitsubishi Electric Corp. bought the hardware manufacturing activities of UK personal computer maker Apricot Computers PLC.

A new Japanese boldness — signaled by Fujitsu's move on ICL — suggests that the rules of the game will be changing.

"Hitachi might be interested in acquiring Olivetti and Comparex," speculated Hank Powell, an analyst at Nomura Research in London. He pointed out that Hitachi landed the European operations — and installed base — of Hitachi Data Systems Corp. (formerly National Advanced Systems) when it acquired the company along with EDS Corp. last year. Hitachi officials would not rule out such a scenario in the long term.

"We don't need to consolidate the three into one — for the time being," said Soji Endo, division manager of Hitachi's overseas computer business in Tokyo.

## Europe is for buyers

In response to new competitive pressures in Europe's mainframe market, IBM is negotiating terms more aggressively, observers said. The result is deep discounting unlike any ever seen before in Europe.

"IBM is becoming more aggressive in their war with us," said Emmanuel Dewitt, Amdahl product marketing manager in France. "They prefer making business at small margins rather than none at all."

According to Chris Peacock, an analyst at IDC Financial Services in London, discounts are reaching as much as 45% of list price for some large customers.

"There is very little differentiation in products right now," he said, "so IBM has to differentiate on prices. The pricing book has gone out the window."

"We're entering a period of much more wheeling and dealing," said Geoff Sewell, director general of the European Computer Leasing and Trading Association in London. If European prices drop far enough, he said, a transatlantic gray market might develop in which brokers and leasing companies buy equipment in Europe for sale in the U.S.

AMIEL KORNEL

## Army awards \$700 million contract to EDS, Prime

BY GARY ANTHES  
and SALLY CUSACK  
CW STAFF

The U.S. Army handed a contract worth up to \$700 million to Electronic Data Systems, Inc. (EDS) for as many as 20,000 multiuser microcomputers with related equipment, software and systems integration services. Much of the money will flow to financially troubled Prime Computer, Inc., which will supply its Intel Corp. 80386-based systems under a subcontract.

The contract calls for an unspecified number of Unix-based Prime EXL 320 systems to be delivered over a period of one to eight years. The computers will be used for defense branches.

A spokesman for EDS refused

to give details about the contract. "We aren't talking until after acceptance testing has been done, in 60 to 90 days," he said.

"The situation is interesting. Prime has never had a good thrust in the office automation marketplace," said George Weiss, an analyst at Gartner Group, Inc.

A year ago, most of the outstanding shares of Prime were bought by J. H. Whitney & Co. in a \$1.1 billion "white knight" rescue after a protracted and bitter struggle against would-be acquirer MAI Basic Four, Inc. [CW, Aug. 28]. Prime posted an operating loss of \$94.7 million on sales of \$1.5 billion last year, and a loss of \$37.1 million on revenue of \$369.8 million for its first quarter this year.

Second-class postage paid at Framingham, Mass., and additional mailing offices.

Computerworld (ISSN 0010-4841) is published weekly, with a single combined issue for the last week in December and the first week in January by CW Publishing/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171.

Copyright 1988 by CW Publishing/Inc. All rights reserved. Computerworld can be purchased on 35 mm microfilm through University Microfilm Int. Periodical Entry Dept., 300 Zeeb Road, Ann Arbor, Mich. 48106. Computerworld is indexed; back issues, if available, may be purchased at \$2.00 per issue, plus postage. Call (800) 669-1002.

Photocopy rights: permission to photocopy for internal or personal use or the internal or personal use of specific clients is granted by CW Publishing/Inc. for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of \$3.00 per copy of the article, plus \$.50 per page is paid directly to Copyright Clearance Center, 27 Congress Street, Salem, MA 01970, 508-744-3350.

Reprints (minimum 500 copies) and permission to reprint may be purchased from Sharon Bryant, CW Publishing/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171. For Back issues contact Margaret McIndoe.

Requests for missing issues will be honored only if received within 60 days of issue date. Subscription rates: \$2.00 a copy; U.S. — \$48 a year; Canada — \$110 a year; Central & So. America — \$130 (surface), \$250.00 (airmail) a year; Europe — \$195 a year; all other countries — \$295 a year. Four weeks notice is required for change of address. Allow six weeks for new subscription service to begin. Subscriptions call toll free (800) 669-1002.



POSTMASTER: Send Form 3579 (Change of Address) to Computerworld, P.O. Box 2044, Marion, OH 43305.

## TRENDS

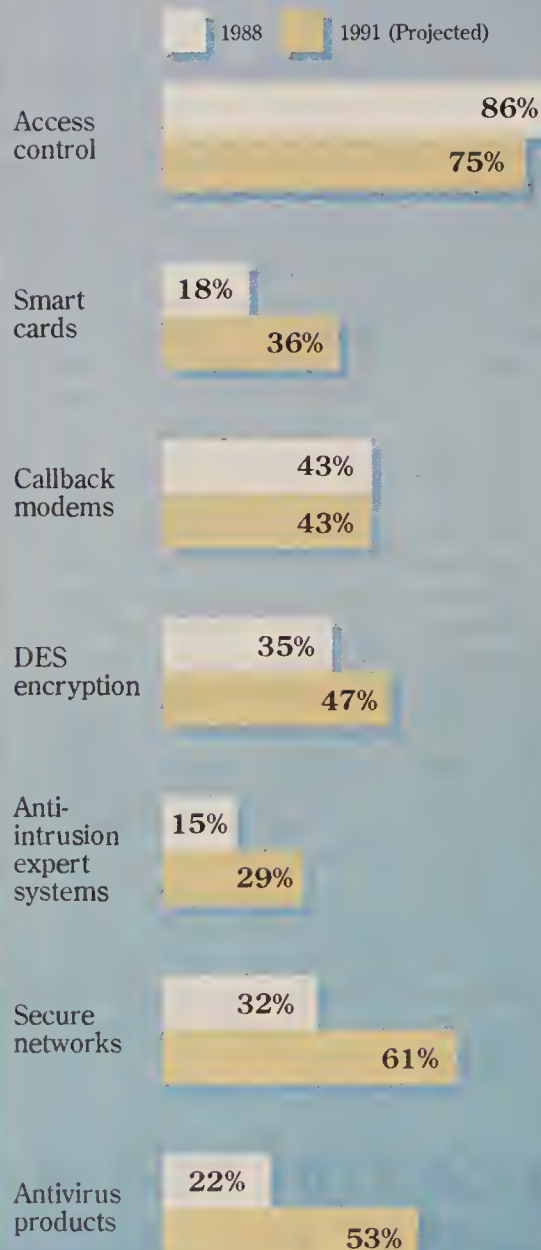


Disgruntled employees, malevolent outside hackers, the antics of ignorant staffers and the accessibility of PCs are making companies throw more attention and money at security issues

## Security technology use

Access controls are by far the most common method of security and the easiest to implement, but securing networks is currently a major issue

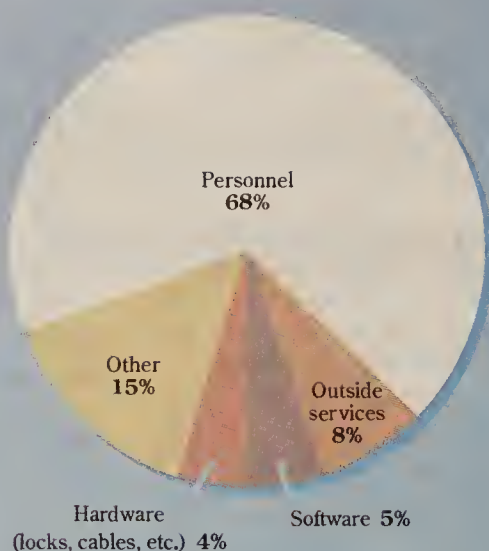
Percent of respondents  
(Base: 3,500)



## Security budget

To prevent damaging accidents as well as calculated offenses, most of a company's security budget is spent on educating its personnel

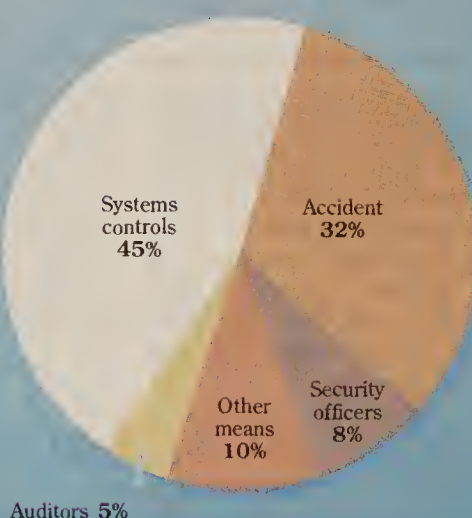
Percent of security budget by expenditure



## How abuse has been discovered

Although most abuse is detected by the system's controls, one-third is still uncovered by accident

Percent of respondents



Source: Electronic Trend Publications, Saratoga, Calif.

CW Chart: Tom Monahan

## N E X T W E E K

Floods of ink have been devoted to analyses of Japan's economic dynamism. One area left conspicuously unexplored, however, is the state of information systems in this powerhouse nation. *Computerworld's* Special Report on IS in Japan supplies that missing piece of the puzzle with a firsthand look at IS management in the land of the yen.



Kinuko Y. Craft

Figuring out how to cost-effectively cope with growing stores of data is becoming a major corporate headache. Luckily, new technologies are emerging that can help. You can read about these developments in Product Spotlight and check Buyers' Scorecard for user evaluations of triple-density direct-access storage devices.

## INSIDE LINES

## Convalescent time

Robert T. Morris, convicted earlier this year for creating a worm program that shut down thousands of computers on the Internet network in November 1988, is "at a local hospital pushing a broom" to fulfill his court-ordered 400 hours of community service, according to his lawyer, Thomas Guidoboni. Morris also has a programming job at an unnamed Cambridge, Mass.-based software company. Guidoboni said he plans to file a brief in the court of appeals but has been waiting for the court reporter in Syracuse federal district court to turn over court transcripts of the trial.

## You go first. No, you go first!

Ingres will add a little seasoning to its Ingres 6.3 relational database engine today. A new automatic two-phase commit feature is being packaged with Ingres 6.3's Ingres/Star distributed component, company sources said last week. The new Ingres feature will allow transactions to be coordinated across an enterprisewide network, preventing incorrect updating of systems in multiple locations. The extra ingredient is likely to sour the soup at archrival Oracle, which lacks two-phase commit in its Version 6.0 product. Oracle's two-phase commit is set for inclusion in Version 7.0, due out later this year.

## Lightening up

Tandy will reportedly unveil a new notebook-size personal computer in New York today that will pack a floppy disk drive, hard disk and battery into a six-pound package. Laptop users are undoubtedly hoping Tandy will be a bit more aggressive with its processor choice than it was with the Intel 8086-based home computer it introduced a couple of weeks ago.

## Time on our hands

Don't try prying off the backplane of your Personal System/2 for a look-see anytime soon at the Intel I586, Intel's follow-on to the I486 chip. "You're getting way ahead of yourself," Chief Executive Officer Andrew Grove told a *Computerworld* staffer last week while awaiting a plane at Boston's Logan Airport. "It's a 1993 product."

## Brazil . . . Nuts!

"Anywhere but Brazil!" could become the battle cry of network managers trying to support their firms' expansion efforts in exotic lands. According to Federal Express telecommunications honcho Pat Greenish, South America is tough, but Brazil is a special case. The government insists that outsiders use the local computer products, which, unfortunately for Federal Express, don't happen to include IBM Systems Network Architecture controllers and printers, Greenish said. There is a several-year waiting list for local private lines to some airport locations, Greenish added. There is also a 5-year backlog for personal phones. The common way to get a telephone there is to have the phone number willed to you by a close relative.

## Is there a doctor in the house?

Add "antivirus virus" to the list of potential ailments to your PC. Antivirus viruses spread like viruses and are designed to attack and eradicate viruses. That's the idea in theory, anyway. The handful of programs that have been released thus far reportedly have not been particularly effective or reliable. One program had a bug that caused it to delete instead of protect files. There is also the risk that the antivirus viruses will be altered to become full-fledged viruses.

*Craig Neidorf* — the electronic newsletter editor whose publication of a "secret" Bellsouth file wasn't such a federal case after all (see page 8) — apparently had at least a partial electronic alibi. U.S. Secret Service agents attended Summercon, a hacker convention held in July 1988, to surreptitiously videotape Neidorf drinking beer and eating a pizza with his alleged co-schemers on the same date that the government alleged he was carrying out the scheme. Before the trial abruptly concluded, prosecutors succeeded in preventing use of the tape as evidence. If you've got facts that shouldn't be quashed, contact News Editor Pete Bartolik at 800-343-6474, fax the incriminating lingo to 508-875-8931, or address concerns to *COMPUTERWORLD* on MCIMail.



# A DEBT OWED TO PEOPLE, NOT TO BANKS.

Like a lot of companies, we ended the '80s in a financial mess.

We had a mountain of debt. And some customers started to wonder: what's most important?

My needs? Or their next debt payment?

At the new Wang, there's no question whatsoever.

Ten months ago, we launched "Operation Customer" and began rebuilding our entire organization around the needs of our customers.

But to make good on that commitment, we had to get our financial house in order.

Since last August, we've cut our bank group debt from \$575 million to \$30 million—soon to be fully repaid, ahead of schedule.

We cut our operating expenses by over \$400 million a year—without laying-off

a single development engineer.

Today, our balance sheet shows cash and cash equivalents of \$165 million.

While tightening our belts, we haven't cut corners. Quite the opposite. We've dramatically raised quality and service.

For example, software bugs have been slashed by over 34%. And on-time deliveries to customers have risen to 92%—up over 15% in less than a year.

People are noticing the difference.

The just-ended fourth-quarter was our best quarter of the fiscal year for revenue. For new system orders. And for sales of our mid-range computer systems.

To complete the repositioning of the new Wang to compete effectively in the radically different marketplace of the '90s, we took restructuring charges and year-end adjustments of \$442 million.

Before those charges, the new Wang achieved near break-even from operations—with a loss of only \$5.6 million in the fourth-quarter vs a \$61.1 million loss in the same quarter a year ago.

We've kept an important promise to our customers.

With that, we believe the slate is clean. Entering fiscal 1991, the playing field is level.

Who made it happen?

The 20,000 people of the new Wang who reached down deep and pulled a company up by its bootstraps.

And the people who are our customers—people who, at 50,000 organizations around the world, hung in there while we got our act together.

We're in their debt. But that's the kind of debt we can work with in the '90s.

LET'S GET TO WORK.

**WANG**

STORAGE MANAGEMENT

SOLUTIONS TODAY. AND TOMORROW.



A growing business mandates more applications and more data to be stored and managed. How will your resources meet this challenge?

With automated storage management products from Sterling Software—solutions that give you immediate functionality and future flexibility.

Sterling Software provides industry standards for file management, volume and data set allocation, and data compression. And our integrated workstation system, Storage Automation Management System (SAMS), reliably automates all your critical storage functions. Fully compatible with IBM's system managed storage strategy (DFSMS), SAMS provides a well-defined bridge to the future—and enterprise-wide system managed storage.

Put Sterling Software to work managing your storage requirements. It's the easy solution for today. And tomorrow. Sterling Software, Systems Software Marketing Division, 11050 White Rock Road, #100, Rancho Cordova, CA 95670. (916) 635-5535.



**STERLING  
SOFTWARE**

THE FUTURE IS STERLING.

Sterling Software, Systems Software Marketing Division, 11050 White Rock Road, #100, Rancho Cordova, CA 95670. (916) 635-5535.